ROMANIA

Reimbursable Advisory Services Agreement on Romania Capacity Building for Statistics (P167217)

OUTPUT No. 14

Report on advisory services provided to Recipient on preparing the

Recommendations and best practices for implementing a functional IT system for GAC2020 (Reports on (i) logistics related to data collection according to the optimal combination identified; and (ii) piloting of the GAC IT application with report and assistance, and advice on best practices and guidance for the maintenance processes and actions of IT system during the go-live production), including the report on two (2) five-day (5) workshops for statisticians on methodologies and tools for transforming questionnaires in intelligent statistical e-questionnaires

June 2022

Revised version July 2022

Project co-financed from the European Social Fund through the Operational Programme for Administrative Capacity 2014-2020

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List of Acronyms

CAPI	Computer-Assisted Personal Interviewing
GAC	General Agriculture Census, round 2020
INS	National Institute of Statistics
IT	Information Technology
RAS	Reimbursable Advisory Services
WB	World Bank

Executive summary

This report presents the advisory services provided to Recipient on preparing the **Recommendations and best practices for implementing a functional IT system for GAC2020 (Reports on (i) logistics related to data collection according to the optimal combination identified; and (ii) piloting of the GAC IT application with report and assistance, and advice on best practices and guidance for the maintenance processes and actions of IT system during the go-live production) including the report on two (2) five-day (5) workshops for statisticians on methodologies and tools for transforming questionnaires in intelligent statistical e-questionnaires**, under the Reimbursable Advisory Services (RAS) Agreement on Romania Capacity Building for Statistics (Project No. P167217). The project is implemented by the National Institute of Statistics (INS) with support from the World Bank (WB).

Through this Output support was provided to the National Institute of Statistics (INS) in implementing the General Agriculture Census round 2020 (GAC) and documenting the system of data collection for major statistical works for the agriculture sector. The advisory services were for training of staff, piloting the agriculture census, preparation and support for running the General Agriculture Census. A brief description of the advisory services is presented below and the detailed are provided in the reports annexed.

Training of the INS staff in preparing the e-questionnaires

The training was considered a preliminary component for preparing the GAC and for the post census structural surveys. The knowledge gained by the participants during training envisaged the support for the preparatory work for the GAC and post GAC period surveys in agriculture. Two 5-day workshops for statisticians on the Survey Solutions Designer App. and on the methodologies and tools for transforming questionnaires in intelligent statistical e-questionnaires were carried out during February 2020 and October 2022.

The workshops were attended by 28 statisticians, the first workshop being for beginners, and the second one for advanced users. The knowledge gained by the participants will support the preparatory work for both GAC2020 and post GAC2020 period surveys - structural surveys on agriculture.

The report presents the process for organizing the workshops and the activities performed, the topics covered, the agenda, the materials developed, the observations of the experts/trainers and several conclusions and recommendations for further improving the skills of the INS statisticians. The materials produced for the workshops are available in electronic format and are described in the annexes provided with the report.

The participants to the workshops offered feedback on the process, knowledge, and skills acquired, showing good understanding of the principles, concepts, tools, and processes of creating templates for data collection for different types of surveys.

Among the skills acquired, the participants can now use different tools and methodologies associated with the preparation of nationwide surveys.

Piloting the GAC IT application for data collection

The GAC pilot was prepared and run in October 2020. The purpose of piloting the GAC was to verify, on a lower scale, the institutional, organizational and logistics set-up and to observe the potential miss-functionalities or shortcomings of the entire process, in order provide recommendations for improvement, fixing or for maintenance during the go-live production of the census.

As the GAC is the largest statistical operation conducted by INS for collecting, processing, and disseminating data on the structure of the agricultural sector, the piloting process was driven by the four characteristics of GAC2020, which required optimized instruments. These were: i) a fully electronic data collection process; ii) fully geo-referenced data collected; iii) continuous quality management applied at each stage of the data collection process; iv) the full population of agricultural holdings covered, according to EU regulations and considering the specificities of the Romanian agriculture.

The need for a GAC piloting process was determined taking into consideration the objective of the census: to collect and provide quality and comprehensive information in an internationally comparable way for around 300 variables concerning the number of farms, area of land used for agriculture, numbers and characteristics of persons carrying out agricultural activities, counting and characteristics of animals, rural development, others.

The report on the GAC pilot was submitted to INS in April 2021 and had five sections. The first section provided an overview of the GAC piloting process in view of the institutional arrangements, organizational aspects, expected data collection and specific variables required. A second section covered the components of the piloting process for the GAC and comprised the activities designed for the pilot together with the description of part of the GAC IT infrastructure (hardware and software) to be put in place. The description of the specific set-up for the software operation systems and applications was presented in the annexes (section five). Section three was a comprehensive presentation of the results of the GAC pilot. An assessment of the achievements and the shortcomings of the pilot was done in section four, forming the basis for the recommendations for actual GAC go-live production. The section covered the revised and adjusted workflow, the IT infrastructure for a smooth data collection process (servers and operation systems, tablets set-up and configuration, technical call center), training and the promotion and communication components for the actual General Agriculture Census.

The pilot exercise provided the basis for the development and testing of the IT integrated system for all stages of the GAC data collection, respectively: the preparation of the draft e-questionnaires for data collection, the establishment of the correlations between variables, the logical control conditions and data protection elements, and the communication with the Survey Solutions application. The report on the pilot was prepared and submitted to the INS.

The shortcomings, dysfunctionalities or further needs for improvements observed during the pilot were discussed with the INS management and experts and advice, capacity building support and recommendations were provided to the INS to ensure a successful actual GAC implementation.

Preparing and running the actual General Agriculture Census

The preparation of the logistics related to data collection was put in place based on the observations collected during the pilot phase and on best practices. Guidance was provided for the maintenance processes and actions of the IT system during the go-live production phase, for the data collection monitoring, control and validation, and for data dissemination. The whole experience has been summarized in a report briefly presented below (the report is attached to this cover summary).

The first section of the report covers the flow of organizing the data collection at all stages, which includes details regarding the process of data collection based on the logical sequences within CAPI and the tasks of the census staff. The flow was decided after the pilot of the GAC and determined the actions for preparing the actual census and the resources needed (roles for census staff, IT equipment and applications).

The actual GAC data collection system is presented in the second section and covers the overall architecture (hardware, operation systems, software applications, databases and electronic services), the high availability structure, the performance framework, the back-up, and the security and testing processes for the data collection system. The detailed configuration of the entire system is presented in the report as an annex dedicated to the IT specialists of INS.

The reports for monitoring the data collection during actual GAC are presented in the third section which provides information on process and samples of reports for the daily monitoring of data collection, overall and by counties, and the reports regarding the activity of the census staff (enumerators, supervisors, observers). The templates of the monitoring reports are provided in annexes and archived in electronic format.

The data collected during GAC passed a process of validation described in the fourth section of the report. This includes the validation and rejection process for the questionnaires and the data control process through tables proposed and developed by WB and INS experts and using algorithms for data cleaning. The validation tables and script applied in this process are provided as an annex to the report and archived in an electronic format for further installation and running by the INS staff.

The INS disseminates the GAC results as a public good. In order to facilitate the access to the GAC results for further requests, the process of accessing the data has been automatized through an application which is presented in section five. The structure, the functions, the data inputs, the set of data outputs and flows of the application are described. The script of the application is provided as an annex and archived in electronic format for further installation and running by the INS staff.

The supporting tools for data production and the sustainability of processes and applications deployed for use by INS are listed alongside all annexes in the sixth section of the report.

The knowledge and experience gained by INS during the actual GAC preparation and implementation form the foundation for the future modernized structural surveys to be used by INS for electronic collecting and processing information about the sector of agriculture.

In sum, Output 14 contains three reports accompanying this cover summary on:

(i) logistics related to data collection according to the optimal combination identified

(ii) piloting the GAC IT application, including advice on best practices and guidance for the maintenance processes and actions of IT system during the go-live production)

(iii) two (2) five-day (5) workshops for statisticians on methodologies and tools for transforming questionnaires in intelligent statistical e-questionnaires

It is important to mention that Output 14 builds on activities presented in other four outputs dedicated to the General Agriculture Census, namely:

> ***Output 2a:*** *Report on advisory services provided to Recipient on the Proposed solution for the modernization of the GAC2020 data collection.*
>
> ***Output 2b:*** *Report on advisory services provided to Recipient on the Proposed recommendations to review the legislation for GAC2020 (one (I) draft note with recommendations for substantiation of Government decisions, and one (I) proposed implementation plan) including the report on two (2) workshops on GAC2020 legislation.*
>
> ***Output 7b:*** *Report on advisory services provided to Recipient on the Recommendations, best practices and guidance in developing a methodology on customizing an IT solution to geo-reference the agricultural holdings in grid-like statistical units GAC2020.*
>
> ***Output 8:*** *Report on advisory services provided to Recipient on the Methodology to assess and promote the quality and coverage of the collected data GAC2020 and data protection/security.*

The team would like to express its gratitude to officials of the National Institute of Statistics, in particular to Florentina Gheorghe, General Director, Silvia Pisica, General Director and Project manager, and to their team of experts for the excellent collaboration.

ROMANIA

Reimbursable Advisory Services Agreement on Romania Capacity Building for Statistics (P167217)

OUTPUT No. 14

(i) Report on advisory services provided to Recipient on logistics related to data collection according to the optimal combination identified

June 2022

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ATU	Administrative Territorial Units
API	Application Programming Interface
APIA	Agency for Payments and Interventions in Agriculture
ASA	Structural Survey in Agriculture (2016)
CAPI	Computer-Assisted Personal Interviewing
CPU	Central Processing Unit
DNS	Domain Name System
DMZ	Perimeter networks/Screened subnetworks
DTS	Statistics Territorial Departments
EU	European Union
GAC/RGA	General Agriculture Census
HTML	Hyper Text Markup Language
INS	National Institute of Statistics
IT	Information Technology
IP	Internet Protocol
NFS	Network File System
OS	Operation System
RAM	Random Access Memory
RAS	Reimbursable Advisory Services
STS	Special Telecommunications Service
SUSO	Survey Solutions
SQL	Structured Query Language
TTL	Time to live
UAA	Used Agriculture Area
VPN	Virtual Private Network
WB	World Bank

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Introduction

This report presents the advisory services provided to the Recipient on preparing the **Recommendations and best practices for implementing a functional IT system for GAC2020 on (i) logistics related to data collection according to the optimal combination identified** under the Reimbursable Advisory Services (RAS) Agreement on Romania Capacity Building for Statistics (Project No. P167217). The project is implemented by the National Institute of Statistics (INS) with support from the World Bank (WB).

This Output is the result of the support provided to the National Institute of Statistics (INS) for implementing the General Agriculture Census and documenting the data collection and production system for major statistical works on agriculture.

The knowledge and experience gained by INS during actual GAC forms the foundation for future structural surveys to be implemented in agriculture. The logistics related to data collection according to the optimal combination identified and implemented during GAC is presented in this report. The report has six sections.

The first section presents the flow of organizing the data collection at all the stages and includes details regarding the process of data collection based on logical sequences within the CAPI and the tasks of the census staff. The flow was decided after piloting the GAC and it determined the actions for preparing the census and the resources needed (enumerators, IT equipment and applications).

The actual GAC data collection system presented in second section describes the overall architecture of the census (hardware, operation systems, software applications, databases and electronic services), the high availability structure, performance framework, the back-up, and the security and testing processes for the data collection system. The detailed configuration of the entire system is attached to the report as an annex dedicated to the IT specialists of INS.

The reports for monitoring the data collection during the actual GAC are presented in the third section, which provides information on the process and samples of the reports for the daily monitoring of data collection, overall and by counties, and on the reports regarding the activity of the census staff (enumerators, supervisors, observers). The templates of the monitoring reports are provided in the annexes and archived in electronic format.

The data collected during the GAC passed a process of validation described in the fourth section. This includes the validation and rejection process of the questionnaires and the data control process through a sequence of tables and using algorithms for data cleaning. The validation tables and the script applied in this process are provided as an annex to this report and archived in electronic format for further installation and running by the INS staff.

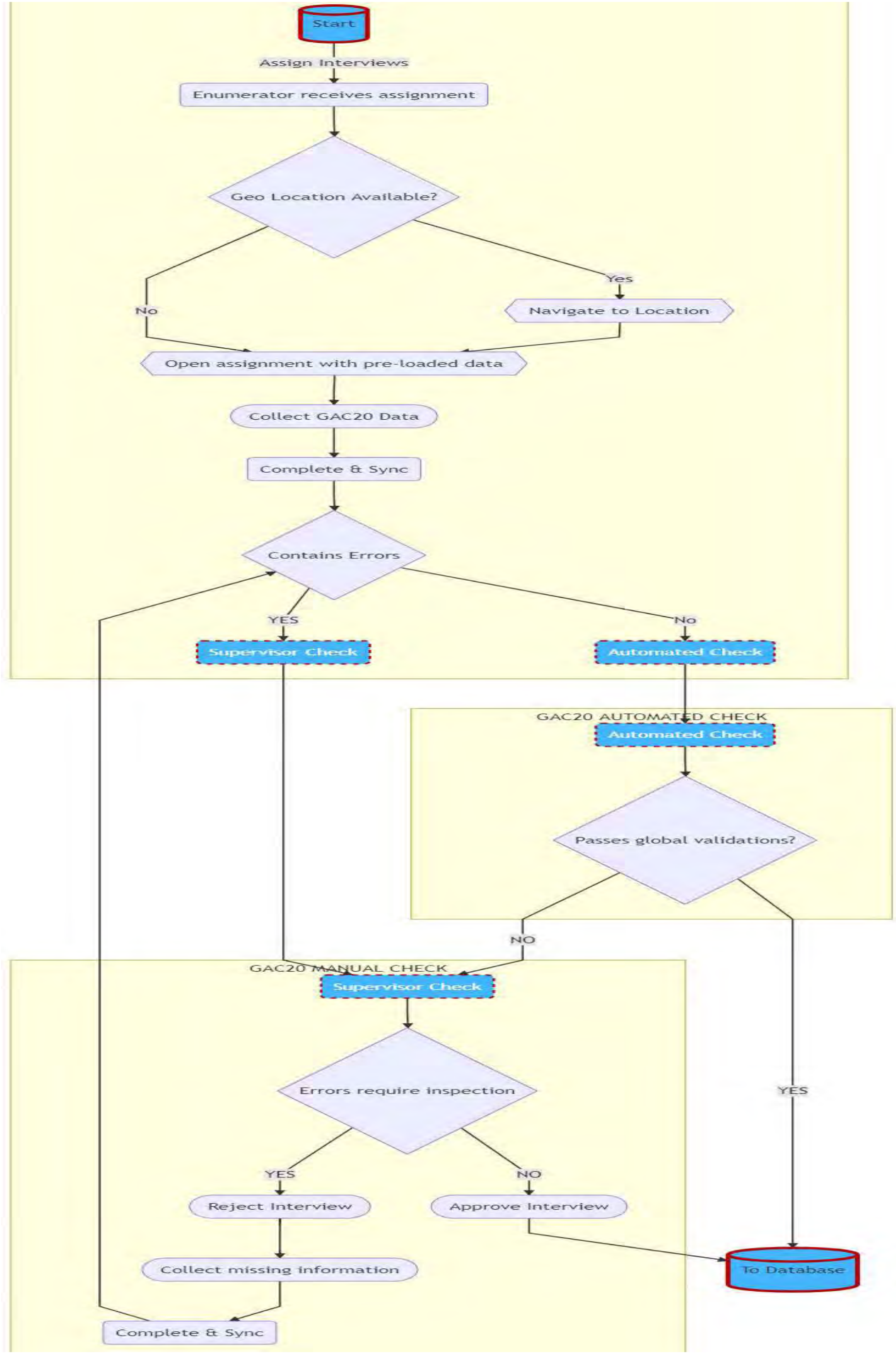
The INS disseminates the GAC results as a public good. In order to respond to further requests for GAC data the process was automatized through an application which is presented in section five. The structure, the functions, the data inputs, outputs and flows describe the application and the way to be used. The script of the application is provided as an annex and archived in electronic format for further installation and running by the INS staff.

The supporting tools for data production and the sustainability of the processes and applications deployed for the use of INS are presented alongside all annexes in the sixth section of the report.

1. The flow of organizing the data collection at all stages of the GAC

The actual GAC data collection used the CAPI method. In preparing the process of data collection for the census, the INS and WB teams applied the recommendations on the GAC workflow and IT infrastructure emerging from the pilot for go-live production.

Figure 1 - GAC workflow



Source: Authors

Based on the workflow resulted from the pilot, the IT infrastructure production environment and the action plan for infrastructure set-up and for tablets set-up and configuration were designed (figures are from the (ii) Report on the GAC pilot of this Output, Section 4).

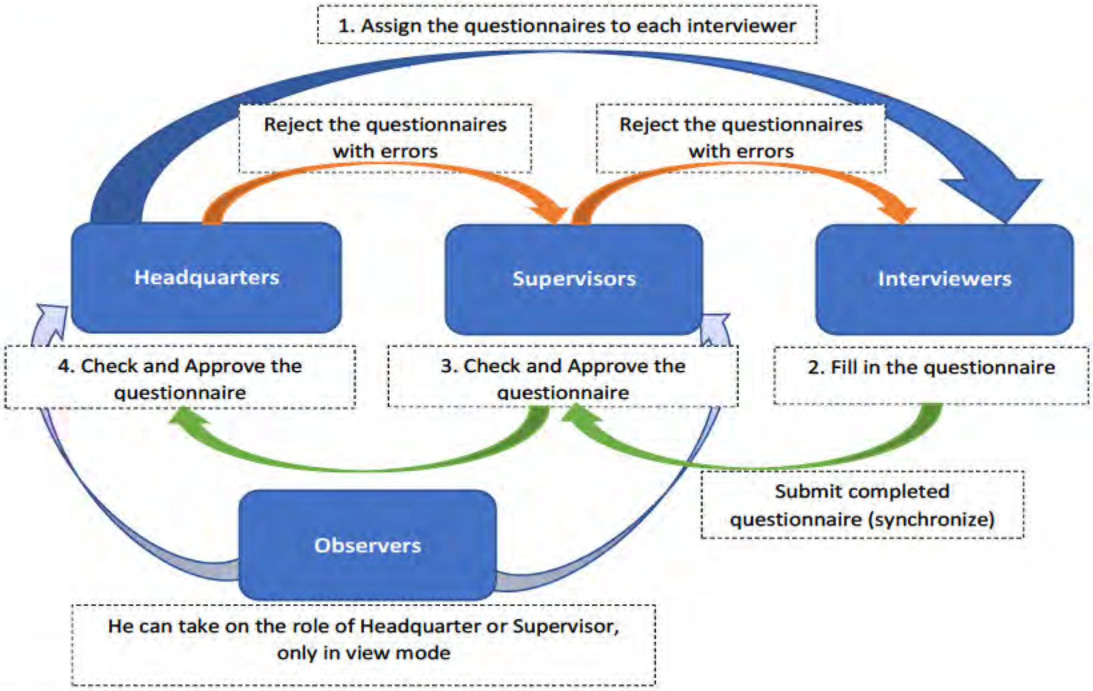
Table 1 - Action plan for GAC infrastructure set-up

Date Start	Date End	Activity	Responsible
2021-03-10	**2021-03-26**	Checking of preloading information received from DTS (based on sectorization results)	INS
	2021-04-12	Provide GAC infrastructure	STS
	2021-04-12	Install operating systems	STS
	2021-04-12	Allow access to World Bank to new system	STS
2021-04-12	**2021-04-14**	Install Survey Solutions & database	World Bank
2021-04-14	**2021-04-15**	Configure Survey Solutions & third-party services - Google Re-captcha, Amazon SES, Google Maps API	World Bank, INS
2021-04-15	**2021-04-16**	Create HQ accounts for INS and DTS	World Bank
2021-04-16	**2021-04-20**	Import questionnaire (Designer - SUSO)	INS
2021-04-16	**2021-04-20**	Set up user access (supervisors, interviewers, observers)	INS
2021-04-16	**2021-04-20**	Set up GAC monitoring	World Bank
2021-04-01	**2021-04-25**	End of training for enumerators	INS
2021-04-26	**2021-04-30**	Upload assignments with preloaded information on questionnaire	INS, World Bank
2021-04-20	**2021-04-27**	Assess application security	STS
2021-04-27	**2021-04-29**	Apply recommendations	World Bank
2021-04-29	**2021-05-04**	Install updated SUSO Interviewer on tablets Empty data sets and prepare for production	World Bank, INS
2021-05-01	**2021-05-10**	**Start of GAC (RGA)**	

Along these activities, specific actions for the training of the enumerators, technical staff and respondents of the call centre were implemented, alongside support for the promotion and communication campaign.

The requirements for data quality and coverage of the collected data were applied during the actual census based on the questionnaire validation workflow supported by the Survey Solutions.

Figure 2 - GAC Questionnaire validation workflow


1. Assign the questionnaires to each interviewer
Reject the questionnaires with errors
Reject the questionnaires with errors
Headquarters
Supervisors
Interviewers
4. Check and Approve the questionnaire
3. Check and Approve the questionnaire
2. Fill in the questionnaire
Submit completed questionnaire (synchronize)
Observers
He can take on the role of Headquarter or Supervisor, only in view mode

*Source: Authors - **initially from the Output no.8***

The data collection quality and coverage and data protection and security were implemented as they were described and agreed by INS and WB in Output no. 8[1], delivered under this RAS Agreement.

The data collection process of GAC2020 has been designed and implemented given considerations derived from the legal EU requirements (e.g. EU Regulation 2018/1091) the national legal framework (GEO no. 22/2020 regarding the organization and implementation of the GAC and GD no. 1056/2020 regarding GAC 2020 budget approval); taking into account the organizational and institutional arrangements between the INS and the Ministry of Agriculture, the Ministry of Internal Affairs, the Special Telecommunications Service; based on the statistical data production conditionalities, the results, observations and recommendations from running the pilot of GAC in 2020, and the technical and informational capabilities existing at the time of the census at INS and stakeholders, respectively the specialized tools for data collection – Survey Solutions provided by WB, the availability of IT environment and communications provided by STS, the expertise and availability of experts at the level of INS and in the DTS (headquarters) (enumerators, supervisors, observers).

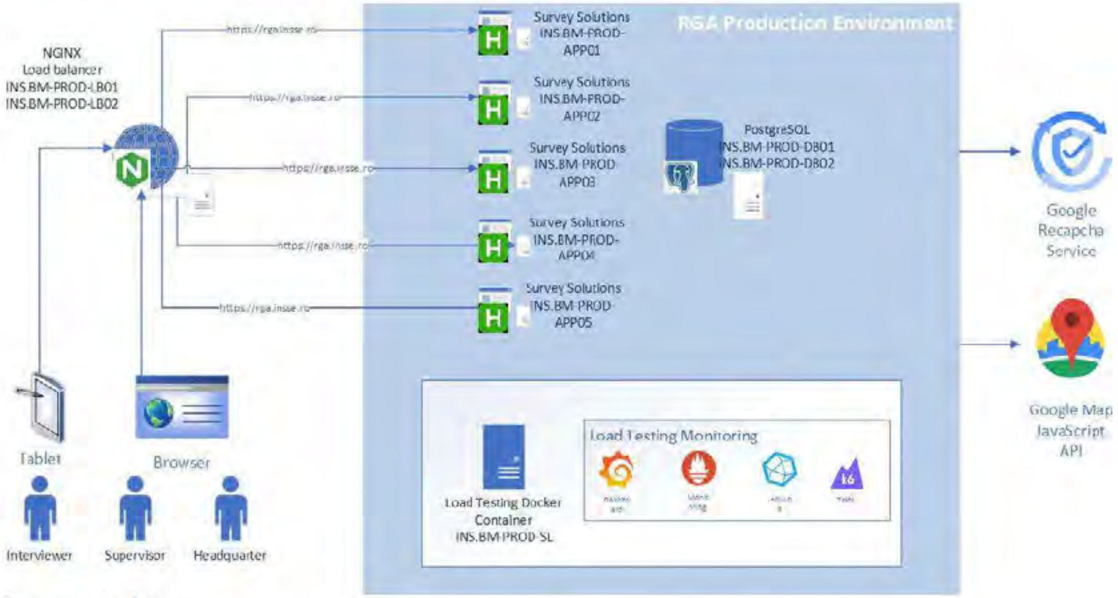
[1] RAS Agreement on Romania Capacity Building for Statistics (P167217); Output no.8: Report on advisory services provided to Recipient on the Methodology to assess and promote the quality and coverage of the collected data GAC2020 and data protection/security.

2. Actual GAC data collection system architecture

2.1. The overall architecture

The actual GAC data collection system was built on a three-tier architecture, consisting in a pair of 2 load balancers serving the web requests, 5 application server nodes and a pair of 2 database nodes. Significant metrics are captured from all nodes and sent to a monitoring node.

Figure 3 - GAC Production environment



Source: Authors

Note: If Chrome was used as a browser, the Recapcha didn't always appear because was remembered the browser. The Google Maps API was used for map reports.

The nodes are virtual machines hosted at the STS premises. The following resources were dedicated to each node:

Table 2 - GAC IT resources assigned

Name	Provisioned Space	Guest OS	Memory Size	CPUs	IP Address
INS.BM-PROD-APP01	82.09 GB	Microsoft Windows Server 2019 (64-bit)	32 GB	8	
INS.BM-PROD-APP02	82.09 GB	Microsoft Windows Server 2019 (64-bit)	32 GB	8	
INS.BM-PROD-APP03	82.09 GB	Microsoft Windows Server 2019 (64-bit)	32 GB	8	
INS.BM-PROD-APP04	82.09 GB	Microsoft Windows Server 2019 (64-bit)	32 GB	8	

Name	Provisioned Space	Guest OS	Memory Size	CPUs	IP Address
INS.BM-PROD-APP05	82.09 GB	Microsoft Windows Server 2019 (64-bit)	32 GB	8	
INS.BM-PROD-DB01	1050 GB	Ubuntu Linux 20.04 (64-bit)	128 GB	32	
INS.BM-PROD-DB02	1050 GB	Ubuntu Linux 20.04 (64-bit)	128 GB	32	
INS.BM-PROD-LB01	58.08 GB	Ubuntu Linux 20.04 (64-bit)	8 GB	4	
INS.BM-PROD-LB02	58.08 GB	Ubuntu Linux 20.04 (64-bit)	8 GB	4	
INS.VM-PROD-SL	98.09 GB	Ubuntu Linux 20.04 (64-bit)	48 GB	16	

An additional 2T sized storage mounted via NFS on first database server node was considered to be used for online backup.

Load balancers

Load balancers are based on NGINX community edition version 1.18. NGINX software is compiled from source in order to enable future customizations. Additional sticky modules were added to NGINX in order to enable session persistence using session cookies.

The role of the two load balancers is to balance web requests coming from Internet (routed via STS network equipment) to the 5 application nodes in a consistent manner, providing session persistence. They are configured in an active-passive high availability configuration, so when one node is down, the other can take over the requests.

Database servers

Database servers are based on Postgresql 12 community edition database management software. Postgresql 12 is installed from specialized repository dedicated to current operating system version.

Database nodes serves as information storage for keeping assignments, interviews, and system and user management information. The database nodes uses active-passive replication, so one node (MASTER) is on read-write mode while the second node (BACKUP) is on read-only. Automatic failover is implemented so in case MASTER is down, the BACKUP node is promoted as master. Also database was configured for online backup, which make possible point in time recovery in case of information inconsistency.

Application servers

Application servers consists in instances of Survey Solution version 21.1.7.30747 which is the latest stable version at the moment of installation. Each node communicates with load balancers on port 9700 via http. A dedicated component called ExportService is enabled only on the first node. This component carries out data export and communicates with all other nodes on port 5001. The service can be called only on server side, and it is not exposed to Internet. Data from Survey Solutions can be either exported via specialized archives format, using web interface or by connecting to another Survey Solutions instance via API.

Monitoring server

Monitoring server relies on a docker set of containers, with Prometheus as central monitoring collector, using also Grafana for metrics visualisations and InfluxDB for metrics recording. Additional functionality is added by a customized k6 deployment which can be used for performance testing.

2.2. High availability

High availability was considered in order to avoid single point of failure in GAC system design. Also, the recovery point objective of one hour (maximum time in which interviewers can stay disconnected from the system) was considered. High availability is implemented in each of the 3 tiers as follows:

- On load balancers, there is an active-passive configuration which bring up a second node in case current node NGINX service is down
- On application servers, since the requests are routed from load balancers, a health check can indicate to load balancers if the current application server node is down, and the request can be re-routed to another node
- On database servers, there is an active MASTER node which server all the requests. Data is replicated to a second node (BACKUP) and there is automatic failover. The failback mechanism is manual for better control of the failure source.

On load balancers, the high availability mechanism was implemented using keepalive software package. Keepalive was configured to bring up a virtual IP on the MASTER node while the NGINX service on this node is healthy, and to bring down the virtual IP on MASTER and bring it up on the BACKUP node in case NGINX is failing on the MASTER node.

Figure 4 - GAC load balancers high availability mechanism

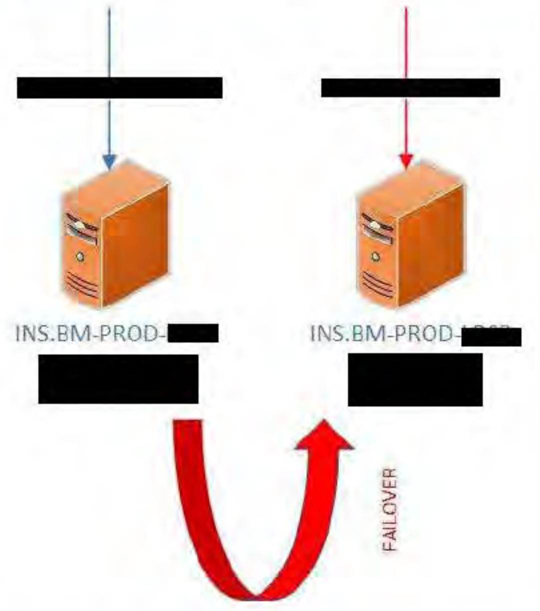
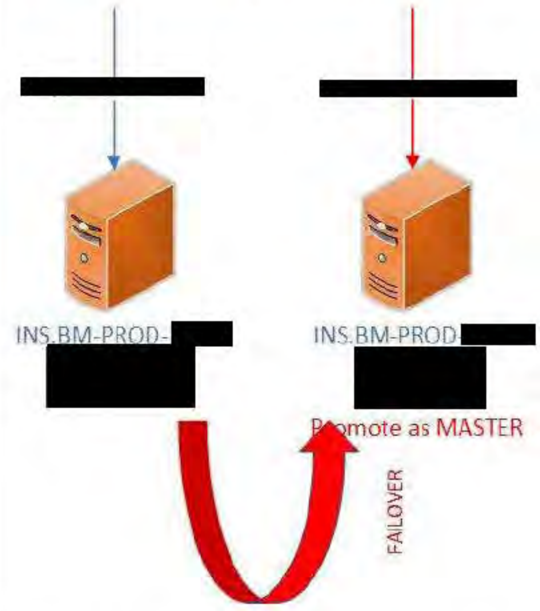


Figure 5 - GAC Database high availability mechanism



A similar high availability mechanism was implemented for databases. In the database nodes case, additional action is needed in order to promote the BACKUP node as MASTER in order to be able to server also write requests to the SQL engine.

In order to check whether the first node is acting as a master so keepalive to be informed about state changes, a custom mechanism was implemented. On the master node, a check script updates information in a table by using current date and time on each 5 seconds. If the information from the table (which is replicated to second node) differs from current date and time with more than 100 seconds, then it means, either the Postgresql server is down, either the server is in read-only mode, so in this case automatic failover can be triggered.

In case of database servers, the failback mechanism is manual and is described in the chapter regarding operations. Due to the fact that failure causes can be multiple, from physical failures to software configurations issues, it is recommended that failback to be operated manually in order to recover initial state.

Databases servers were configured for replication. The replication mechanism chosen was logical replication (see https://www.postgresql.org/docs/12/different-replication-solutions.html). This type of replication has the advantage of being a build in mechanism, providing a high level of consistency and having a minimal footprint on master server operations.

Performance

The system was sized in order to enable 25,000 interviewers to work concurrently. Since the recommended configuration for a single node was proven to carry out at least 6,000 interviewers, then 5 application nodes should be more than enough to handle the GAC. However, it is important to mention the role of enumerators in a smoothly run of census, respectively the system works at normal parameters only if the reviewers / enumerators respect the way and instructions of they work using the data collection application without making unnecessary queries or reports in the application, especially during peak hours. A process of scaling up and calibration of IT infrastructure is possible every time, but requires IT resources in place, on the spot from the host of data collection system (STS for GAC2020).

Backup

Due to high availability architecture, backup of server configurations is not needed since each node configuration is backed up in another node. So, the backup of the system reduces to backup of the data.

Postgresql was configured for online backup, so point in time consistent recovery is possible in order to recover from logical failures. Archive logging is configured on each MASTER node in both datacenters.

Security

The system physical security relies on security controls implemented on STS datacenters and INS and WB internal procedures and regulations for users accessing the system from terminals hosted by either INS and WB.

The system logical security has different levels of protection:

- STS Network firewalls are protecting access to the systems hosted in STS datacenters. Access to public web interface of the system is restricted to national IPs.
- All machines have implemented hosts firewalls which allows only minimal traffic required for system functionality
- Windows Severs are protected by Windows Defender native anti-virus

- Administrative access to the system is protected by restricted VPN point-to-site solution, available only to authorized personnel
- Access to web application is possible only to authenticated users. Username and password are mandatory for accessing system functionalities, and privileged users are additionally protected by 2 factor authentication. Also, a captcha mechanism (Google Recaptcha service) is used in order to deny programmatic access.

The overall security of the system was assessed by STS according to best practices. In order to continuously protect against common vulnerabilities, security patches for system components were applied on regular basis during production.

2.3. Log management

All the systems logs were centralized by STS. This allows setting alerts in order to notify responsible persons for particular events, related to system security, availability and reliability.

2.4. Disaster recovery

Disaster recovery mechanism relies on DNS switching and database replication. First node on the secondary site is continuously replicating from first node of the primary site using streaming replication, so the database on the secondary site is up-to-date in a consistent manner.

When a disaster situation is declared by responsible persons, the disaster recovery procedure is triggered and will have those main phases:

1. Switch network connectivity from primary to secondary site. This will use DNS record updating, so the changes will be applied according to agreed TTL. In this case, this will be one hour. The second site load balancers will publish initially a maintenance notification HTML page.
2. Meanwhile, a manual procedure will promote the first database node on the second datacenter to become MASTER. Replication with secondary node in second datacenter will be set up, and when everything is up, the other services will be started.
3. The maintenance notification page will be replaced with a redirect to SuSo services, so the users can access new environment.

It is very important to maintain configuration on secondary datacenter to be the same as in primary datacenter, so every time when configuration changes in primary datacenter, it should be replicated on secondary datacenter.

Following resources were used in secondary datacenter in order to cover the capacity of the primary datacenter:

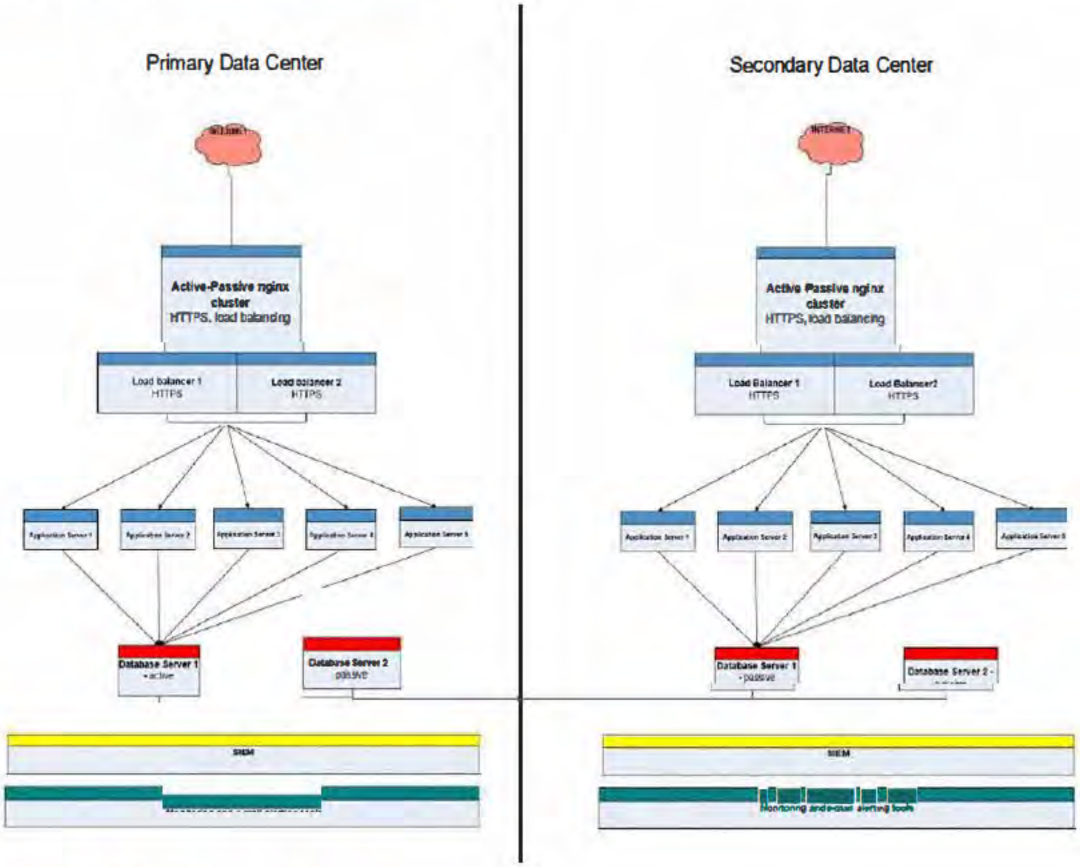
Table 3 - GAC Secondary datacenter resources

Name	Provisioned Space	Guest OS	Memory Size	CPUs	IP Address
INS.BM-DR-APP01	82.09 GB	Microsoft Windows Server 2019 (64-bit)	32 GB	8	
INS.BM-DR-APP02	82.09 GB	Microsoft Windows Server 2019 (64-bit)	32 GB	8	
INS.BM-DR-APP03	82.09 GB	Microsoft Windows Server 2019 (64-bit)	32 GB	8	

Name	Provisioned Space	Guest OS	Memory Size	CPUs	IP Address
INS.BM-DR-APP04	82.09 GB	Microsoft Windows Server 2019 (64-bit)	32 GB	8	
INS.BM-DR-APP05	82.09 GB	Microsoft Windows Server 2019 (64-bit)	32 GB	8	
INS.BM-DR-DB01	1050 GB	Ubuntu Linux 20.04 (64-bit)	128 GB	32	
INS.BM-DR-DB02	1050 GB	Ubuntu Linux 20.04 (64-bit)	128 GB	32	
INS.BM-DR-LB01	58.08 GB	Ubuntu Linux 20.04 (64-bit)	8 GB	4	
INS.BM-DR-LB02	58.08 GB	Ubuntu Linux 20.04 (64-bit)	8 GB	4	
INS.VM-DR-SL	98.09 GB	Ubuntu Linux 20.04 (64-bit)	48 GB	16	

Also, a dedicated NFS storage is presenting 2T space to the first node of INS.BM-DR-DB01.

Figure 6 - STS Survey Solutions initial configuration



Virtual Machines (Testing Target)

- Load Balancer
  - 2x - 4vcpu, 8GB RAM

    - Linux Server (Ubuntu 20.04 LTS)
    - NGINX Load Balancer
- Application Servers
    - 5x - 8vcpu, 32GB RAM
    - Configured with Windows Server 2019
    - Survey Solutions HQ
- Database Server
    - 2x - 32vcpu, 128GB RAM
    - Windows Server or Linux (Ubuntu 20.04 LTS)
    - PostgreSQL Server (version 12.4)

Load Testing Machine (Source of Load)

- 1x 16vcpu, 48GB RAM
- Linux OS (Ubuntu 20.04 LTS)
- Docker

Network(s):
DMZ – 2 x Load Balancers
Private – 5 x Applications Servers, 1 x Database Server, 1 x Load Testing

Ports between networks:
Internet - Load Balancers 80, 443 (port 80 will be re-directed to 443 after SSL cert installation)
DMZ – Internet 80, 443

Load Testing – Load Balancers – 443, 9100, 8080
Load Balancers – Application Servers – 9700

Private – Internet 80, 443

The detailed configuration of the system is presented in **Annex 1 - GAC data collection information system – As-built report.**

Note: This is STS configuration - the information in Annex 1 to be used for the configuration of the INS's future structural surveys on its new integrated IT system

3. Monitoring and reporting during the GAC data collection

3.1. Daily monitoring and reporting

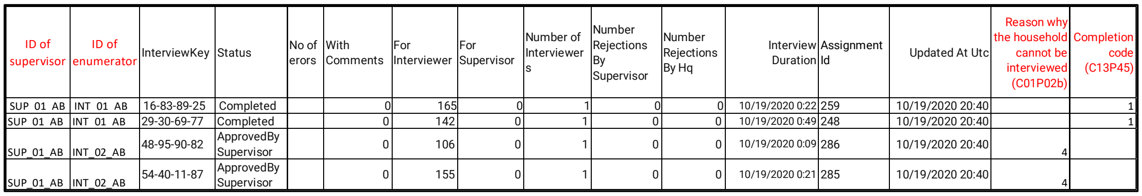
The monitoring and reporting process for data collection represented a daily task realized for the entire period of the GAC (May 10 – July 31, 2021) as a joint effort of INS and WB teams. The GAC questionnaire validation workflow (Figure 3, above) was applied he and this supported the process of obtaining accurate information about the status of data collection.

The monitoring and reporting process used the data gathered from Survey Solutions, namely the data export of the activities performed by the enumerators for filling the questionnaires the day before, about the opened questionnaires and the completed ones by each census staff with roles in SuSo and by ATU and counties. Annex 2 provides the sample of the data collection report generated every day by questionnaire, by ATU and by county, archived in electronic format. The information collected at this stage was used by the INS GAC team to generate various reports. The data obtained could be organized on different layers: enumerator/(by sector) supervisor,, coordinator, ATU, county and totals.

The reports generated were structured as:

- A Report for monitoring data collection which included information about the supervisor and enumerator ID, on Interview Keys, number of errors, comments for the Enumerator and for the Supervisor, number of interviewers, number of rejections by the Supervisor, interview duration and assignment ID, reasons for "why the agriculture holding cannot be interviewed" coded(C01P02b)[2] and the completion code of interview – see the sample below.

Figure 7 - Sample of report for Monitoring of data collection

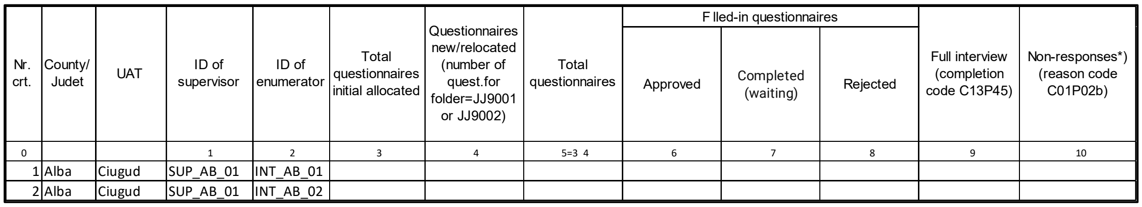


ID of supervisor	ID of enumerator	InterviewKey	Status	No of erors	With Comments	For Interviewer	For Supervisor	Number of Interviewers	Number Rejections By Supervisor	Number Rejections By Hq	Interview Duration	Assignment Id	Updated At Utc	Reason why the household cannot be interviewed (C01P02b)	Completion code (C13P45)
SUP 01 AB	INT 01 AB	16-83-89-25	Completed		0	165	0	1	0	0	10/19/2020 0:22	259	10/19/2020 20:40		1
SUP 01 AB	INT 01 AB	29-30-69-77	Completed		0	142	0	1	0	0	10/19/2020 0:49	248	10/19/2020 20:40		1
SUP_01_AB	INT_02_AB	48-95-90-82	ApprovedBy Supervisor		0	106	0	1	0	0	10/19/2020 0:09	286	10/19/2020 20:40	4	
SUP_01_AB	INT_02_AB	54-40-11-87	ApprovedBy Supervisor		0	155	0	1	0	0	10/19/2020 0:21	285	10/19/2020 20:40	4	

- A Report for monitoring data collection by ATU, supervisors and enumerators which provided information by each county and localities (ATU) about the total questionnaires initially allocated, new/relocated questionnaires (number of questionnaires for folder=JJ9001 or JJ9002), total questionnaires, the filled -in questionnaires approved, completed (waiting for approval/rejection) or rejected, the full interview (completion code C13P45) or non-responses*) (reason code C01P02b);

[2] According to the correspondence available for GAC 2020 structure of database

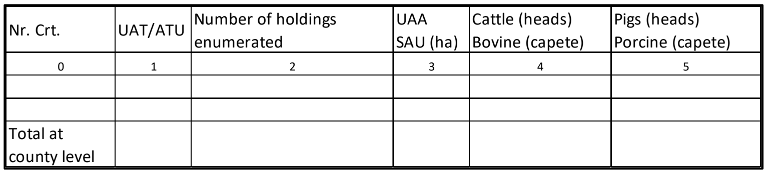
Figure 8 - Sample of report for Monitoring of Data collection by ATU, supervisors and enumerators



Nr. crt.	County/ Judet	UAT	ID of supervisor	ID of enumerator	Total questionnaires initial allocated	Questionnaires new/relocated (number of quest.for folder=JJ9001 or JJ9002)	Total questionnaires	F lled-in questionnaires			Full interview (completion code C13P45)	Non-responses*) (reason code C01P02b)
								Approved	Completed (waiting)	Rejected		
0			1	2	3	4	5=3 4	6	7	8	9	10
1	Alba	Ciugud	SUP_AB_01	INT_AB_01								
2	Alba	Ciugud	SUP_AB_01	INT_AB_02								

- A Report for monitoring the data collected at the level of every county and the administrative territorial units within it on the Used Agriculture Area (UAA), the cattle and pigs counting.

Figure 9 - Report on UAA, cattle and pigs by ATU (county)



Nr. Crt.	UAT/ATU	Number of holdings enumerated	UAA SAU (ha)	Cattle (heads) Bovine (capete)	Pigs (heads) Porcine (capete)
0	1	2	3	4	5
Total at county level					

Following the monitoring process and the distribution of tasks, the information generated was consolidated into daily reports that allowed the GAC coordination team from INS to inform and advise DTSs and, enumerators, supervisors and observers about the status of data collection and the level of coverage.

The templates of the reports are available in electronic format and are delivered archived with this report as **Annex 2 - - Sample reports of daily monitoring.**

3.2. Census staff's activity monitoring and reporting for payment

The reporting process on the activity of the census staff had two dimensions: one regarding the reporting on activity and the other one used for the calculation of the gross amounts paid to census staff.

The monitoring of data collection (using the daily exports from Survey Solutions) was used for the coordination of activities at the level of enumerators, supervisors, coordinators and for administrative processes regarding the payment of the work done by them. The information regarding the volume of the questionnaires filled in, the status of the questionnaires (rejected, completed, approved) provided the base information for the monitoring and coordination of the enumerators and later for the payment for their effort (see a sample of a report in the figure below).

Figure 10 - Sample of report for census' staff activity

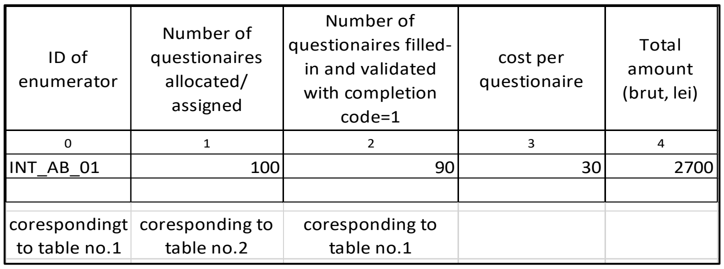
County	Interviewer Assigned	Rejected By Supervisor	Completed	Approved By Supervisor	Rejected By Headquarters	Approved By Headquarters	Total	Total Assignments
AB	11	615	4196	23092	293	2795	31002	77701
AG	1	4647	11785	38585	2211	1752	58981	151076

County	Interviewer Assigned	Rejected By Supervisor	Completed	Approved By Supervisor	Rejected By Headquarters	Approved By Headquarters	Total	Total Assignments
AR	0	792	3210	29364	428	2649	36443	62915
B_	0	11	53	41	4	11	120	260

The information regarding the data collected, the quality and quantity of the approved questionnaires represented the input for the total amount paid to an enumerator. Similarly, the process of calculating the effort and amounts paid was applied for chief enumerators (supervisors) and for coordinators located at each administrative territorial unit level. In their case in order to justify the time allocated and spent for census activities it was mandatory to fill in a descriptive activity report of the supervisor/coordinator to accompanies the payment situation.

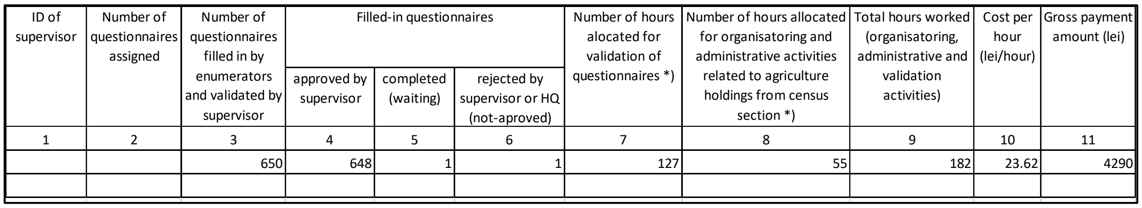
The sample of the payment reports and the instructions regarding the correspondence of the inputs from Survey Solutions are presented in the figures below.

Figure 11 - Sample of enumerator activity and payment report



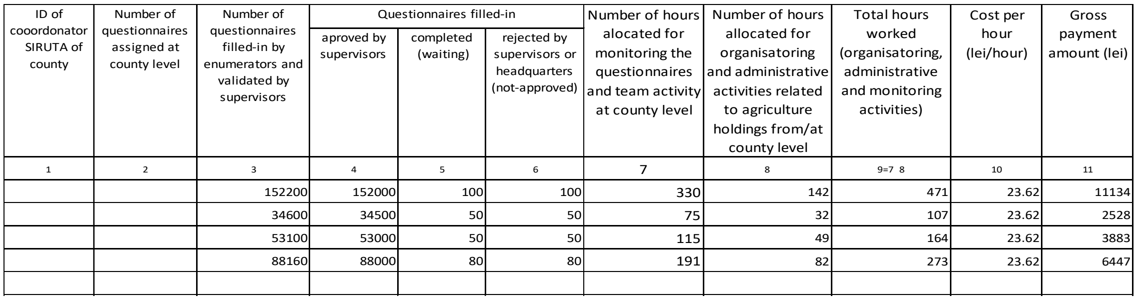
ID of enumerator	Number of questionaires allocated/ assigned	Number of questionaires filled-in and validated with completion code=1	cost per questionaire	Total amount (brut, lei)
0	1	2	3	4
INT_AB_01	100	90	30	2700
corespondingt to table no.1	coresponding to table no.2	coresponding to table no.1		

Figure 12 - Sample of chief enumerator activity and payment report



ID of supervisor	Number of questionnaires assigned	Number of questionnaires filled in by enumerators and validated by supervisor	Filled-in questionnaires			Number of hours alocated for validation of questionnaires *)	Number of hours allocated for organisatoring and administrative activities related to agriculture holdings from census section *)	Total hours worked (organisatoring, administrative and validation activities)	Cost per hour (lei/hour)	Gross payment amount (lei)
			approved by supervisor	completed (waiting)	rejected by supervisor or HQ (not-aproved)					
1	2	3	4	5	6	7	8	9	10	11
		650	648	1	1	127	55	182	23.62	4290

Figure 13 - Sample of coordinator activity and payment report



ID of cooordonator SIRUTA of county	Number of questionnaires assigned at county level	Number of questionnaires filled-in by enumerators and validated by supervisors	Questionnaires filled-in			Number of hours alocated for monitoring the questionnaires and team activity at county level	Number of hours allocated for organisatoring and administrative activities related to agriculture holdings from/at county level	Total hours worked (organisatoring, administrative and monitoring activities)	Cost per hour (lei/hour)	Gross payment amount (lei)
			aproved by supervisors	completed (waiting)	rejected by supervisors or headquarters (not-approved)					
1	2	3	4	5	6	7	8	9=7 8	10	11
		152200	152000	100	100	330	142	471	23.62	11134
		34600	34500	50	50	75	32	107	23.62	2528
		53100	53000	50	50	115	49	164	23.62	3883
		88160	88000	80	80	191	82	273	23.62	6447

All samples of the reports are presented in **Annex 3 - Sample reports of census's staff activity** and are provided archived in an electronic format.

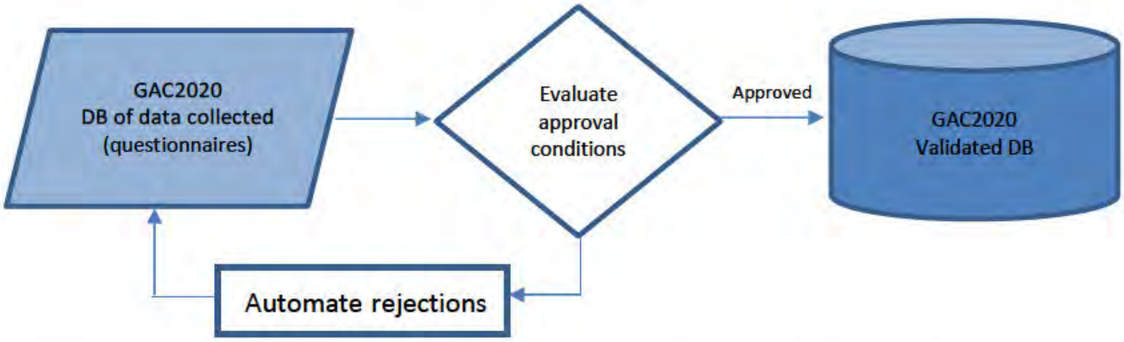
4. Validation process of the collected data

The purpose of the validation process was to support the transmission of the results to the Eurostat, in the predefined format of the Eurofarm file (the same for all EU member states) and the dissemination of the results to other users (national / international): publications (predefined tables) and tables produced following ad-hoc requests. This section presents information on the process and tools for the validation of the data collected, consolidated on the automatic acceptance and rejection of the questionnaire, and on the control tables.

4.1. Automatic acceptance, rejection of questionnaires

The automatic acceptance or rejection of the questionnaires was prepared in order to ensure the data quality and by control of the data collected. The process is run and completed with the support of scripts in the R programming language and applied to the available set of data (see the flow below).

Figure 14 - Automatic acceptance/rejection flow



The result of the process provides information on the accepted or rejected questionnaires collected during GAC. The data collected from the approved questionnaires is further used for analysis of data and specific comparisons (through control tables – see further) by different layers of variables and for the production of indicators. The rejected questionnaires are returned to the interviewers tablet to be corrected.

The R scripts are archived and delivered separately in the report **Annex 4 - Script for automatic acceptance / rejection of questionnaires**.

4.2. Control tables

The GAC2020 control tables are used for data processing-validation and to support the comparison with other data sources (e.g. GAC2010, ASA 2016, APIA) in the support of the INS staff for statistical production for the agriculture sector.

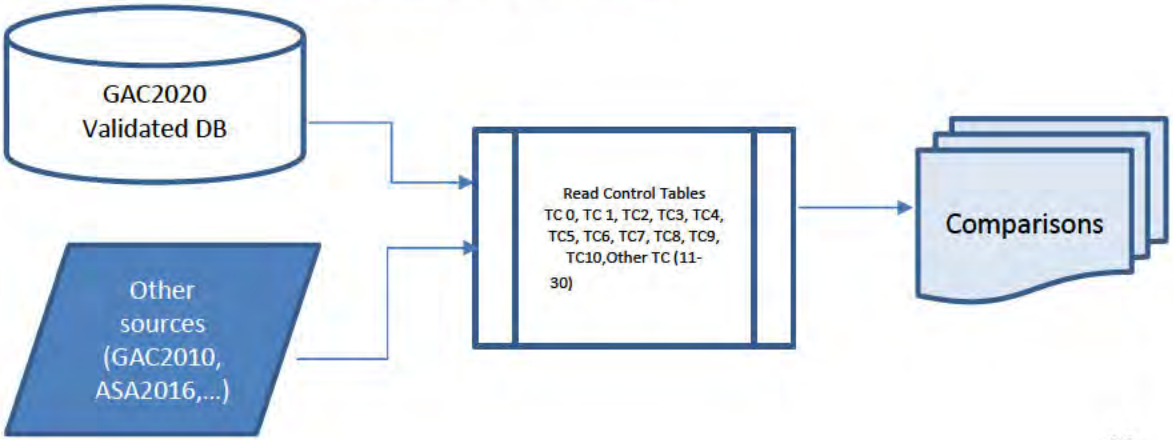
The control tables are prepared in the R programing language and allow to use all database variants/ versions, run whenever necessary for data extraction and aggregation in various combinations for analysis, corrections to be made and validation of results. Also, the resulting files are available in Excel-type files or usable with Excel. Ten control tables are provided as support to the INS GAC team under this output (see the table below). and a number of other tables were developed by INS team in Visual FoxPro.

Table 4 - Control Tables

Table Indicative	Tilte (short description)	Data Sources
TC 0	Number of database records - questionnaires on complete codes and counties	GAC2020
TC 1	Agricultural holdings, by legal status, by counties	GAC 2020
TC 2	Agricultural holdings, which use foreign-owned land, by counties	GAC 2020
TC 3	Agricultural holdings, by counties - comparisons	GAC 2020 Other sources
TC 4	Agricultural holdings, areas and livestock, by counties and localities (ATUs) and legal status	GAC 2020
TC 5	Agricultural holdings, areas and livestock, by counties and legal status	GAC 2020
TC 6	UAA by counties, total agricultural holdings comparisons	GAC 2020 Other sources
TC 7	UAA by counties, agricultural holdings without legal personality	GAC 2020 Other sources
TC 8	UAA by counties, agricultural holdings with legal personality	GAC 2020 Other sources
TC 9	UAA at RGA 2020 moment, for counties and localities within them – comparisons	GAC 2020 Other sources
TC 10	Location of agricultural areas according to the legal status of the holdings and by use categories	GAC 2020
TC 11-30	Other tables defined within the project and developed by INS team in Visual FoxPro	GAC 2020 Other sources

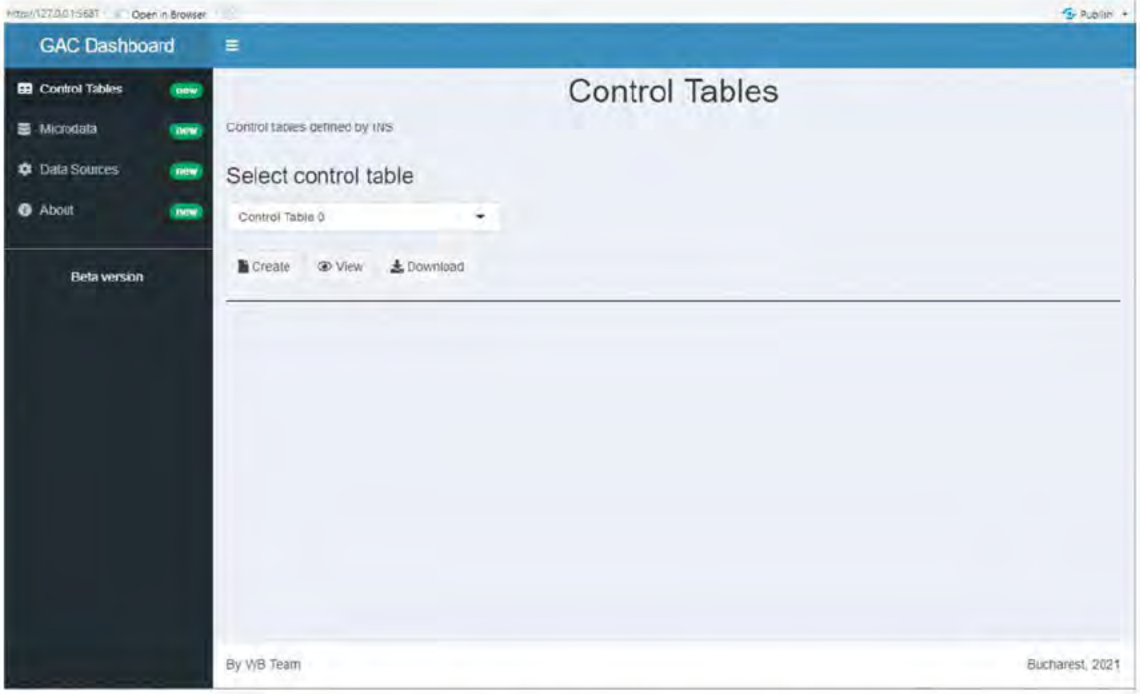
With the exception of TC 0 (see **Annex 6 – Sample of data control tables**), all other tables created in R by WB team are processed only for completeness code records. The flow of getting comparable data through control tables is presented below:

Figure 15 - Control tables flow for data comparison and data validation



The application for GAC2020 Control Tables is functional on the INS IT environment ("Analysis Server" - link http://xx.xx.xxxx/GAC_Dashboard.
This is done in R and Shiny programing languages and RStudio. For the installation and configuration of the server was provided technical assistance and, also, for the basic applications (R and RStudio) on a Linux OS server. The Visual FoxPro application will be hosted on a distinct IT environment due to OS mentioned. Online information and support are available through CRAN (https://cran.r-project.org/web/packages/officer/index.html) for manipulation of Microsoft Word and Microsoft PowerPoint documents[3].

Figure 16 - Control tables application



Control Tables

Control tables defined by INS

Select control table

Control Table 0

By WB Team

Bucharest, 2021

The guidelines for using the GAC dashboard application are recorded and available at https://worldbankgroup.webex.com/recordingservice/sites/worldbankgroup/recording/c1c546ecd376103a83cf005056819aa3/playback. We recommend the download and reposits by INS.

The scripts prepared for Control Tables are archived and delivered separately in the report **Annex 5 - Scripts of data control tables.**

[3] CRAN-R officer allows to *"Access and manipulate 'Microsoft Word' and 'Microsoft PowerPoint' documents from R. The package focuses on tabular and graphical reporting from R; it also provides two functions that let users get document content into data objects. A set of functions lets add and remove images, tables and paragraphs of text in new or existing documents. The package does not require any installation of Microsoft products to be able to write Microsoft files"*

5. Dissemination of the GAC results

Disseminating of the GAC results represents a part of the INS mission as official statistics producer. For dissemination, the INS and WB analyzed the possibility of a solution as an application - database interface to allow the INS staff to browse the GAC data, filter it based on territorial levels, and group it based on several layers. As a result, the WB team proposed and supported the development of a Shiny[4] web application based on the R programming language, allowing fast data integration, wrangling and reproducibility (see https://shiny.rstudio.com/).

5.1. The description of the application

The main objective of the application is to quickly integrate the raw data (at record level/agriculture holding level) provided by GAC, to summarize key variables at the ATU level, to group the variables and allow fast exports to deliver in the case of data requests from INS or external data users.

The application has two modes of functioning. One is server-based, while the other is local. The key difference between the two modes of functioning is data availability and consistency. In the case of the server-based version, the application will run on a centrally maintained database/data source and will give the same output to all users. In addition, any changes made to the scripts will affect how the app delivers its outputs to all users. On the other hand, the local version allows the user to make changes locally, for data and scripts, but these changes will only affect the users' local copy of the application.

The application for GAC data dissemination is functional on the INS IT environment ("Analysis Server") - link **http://xx.xx.xxx.xx/rga-diseminare/**.

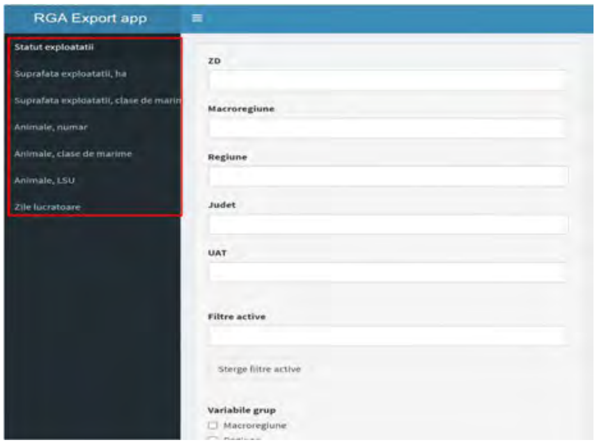
We recommend that the application will only be run on a server part of INS IT environment as it will limit local changes biased by user intervention. The local version use should be limited to development purposes, and final changes should be pushed on the server version.

5.2. Structure of the dissemination application and main functions

The application is structured based on the key variables requested by indicators productions to cover: the legal status of agricultural exploitations, surface of agricultural lands (hectares and class size), number of animals (raw numbers, class size and LSU), and workdays.

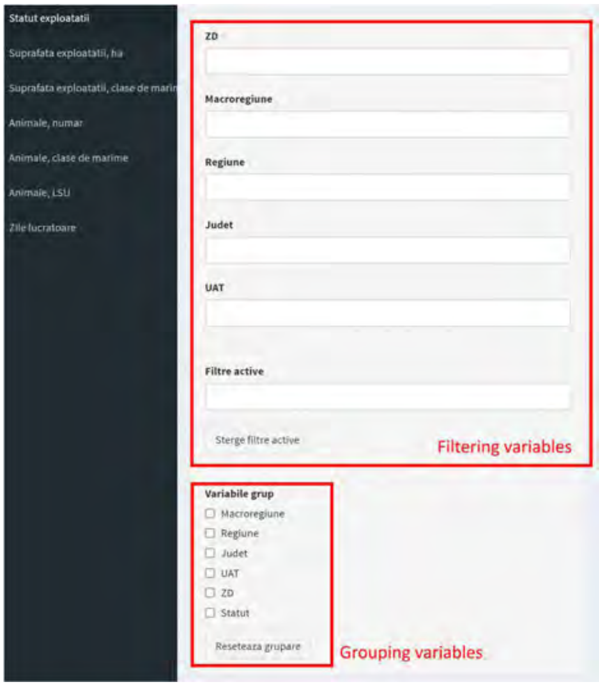
[4] Shiny is an R package that makes it easy to build interactive web apps straight from R.

Figure 17 - Key variables of dissemination application



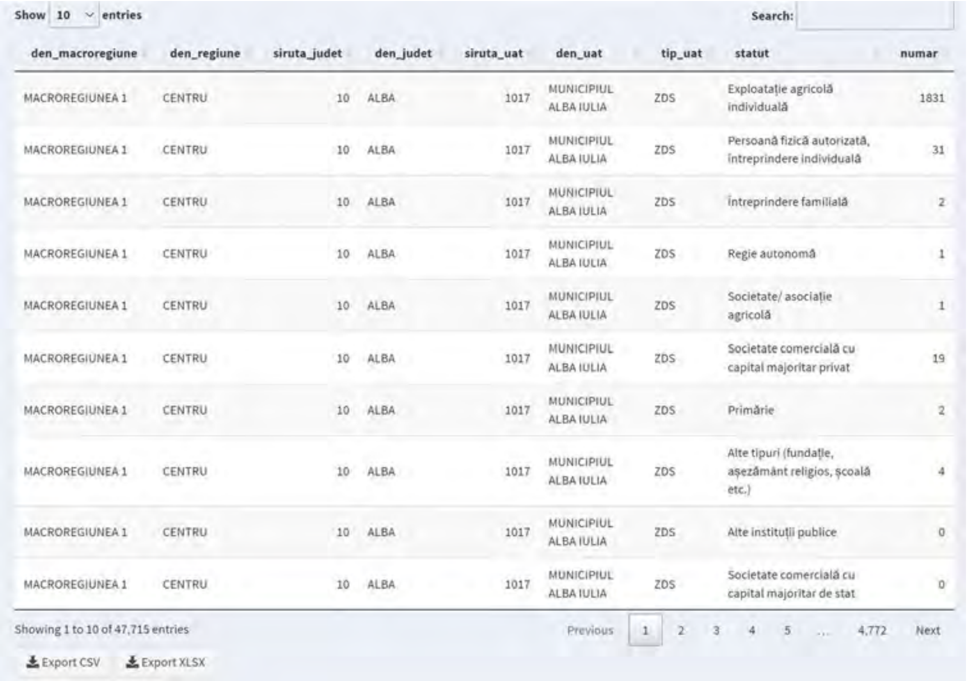
The application uses the same structure of filters based on Romania's territorial and administrative system and the disadvantaged areas criteria. The lowest territorial-administrative unit used is the municipality (the basic ATU). In addition, several grouping variables were used for each of the key variables to allow further drill-downs.

Figure 18 - Filtering and grouping the variables



The application's output is summed up in a dynamic table that allows for quick previewing of the data results and exports in CSV and Excel formats.

Figure 19 - Application data results format



den_macroregiune	den_regiune	siruta_judet	den_judet	siruta_uat	den_uat	tip_uat	statut	numar
MACROREGIUNEA 1	CENTRU	10	ALBA	1017	MUNICIPIUL ALBA IULIA	ZDS	Exploatație agricolă individuală	1831
MACROREGIUNEA 1	CENTRU	10	ALBA	1017	MUNICIPIUL ALBA IULIA	ZDS	Persoană fizică autorizată, întreprindere individuală	31
MACROREGIUNEA 1	CENTRU	10	ALBA	1017	MUNICIPIUL ALBA IULIA	ZDS	Întreprindere familială	2
MACROREGIUNEA 1	CENTRU	10	ALBA	1017	MUNICIPIUL ALBA IULIA	ZDS	Regie autonomă	1
MACROREGIUNEA 1	CENTRU	10	ALBA	1017	MUNICIPIUL ALBA IULIA	ZDS	Societate/ asociație agricolă	1
MACROREGIUNEA 1	CENTRU	10	ALBA	1017	MUNICIPIUL ALBA IULIA	ZDS	Societate comercială cu capital majoritar privat	19
MACROREGIUNEA 1	CENTRU	10	ALBA	1017	MUNICIPIUL ALBA IULIA	ZDS	Primărie	2
MACROREGIUNEA 1	CENTRU	10	ALBA	1017	MUNICIPIUL ALBA IULIA	ZDS	Alte tipuri (fundație, așezământ religios, școală etc.)	4
MACROREGIUNEA 1	CENTRU	10	ALBA	1017	MUNICIPIUL ALBA IULIA	ZDS	Alte instituții publice	0
MACROREGIUNEA 1	CENTRU	10	ALBA	1017	MUNICIPIUL ALBA IULIA	ZDS	Societate comercială cu capital majoritar de stat	0

Showing 1 to 10 of 47,715 entries

5.3. Data inputs, outputs and flows

Data inputs and calculations

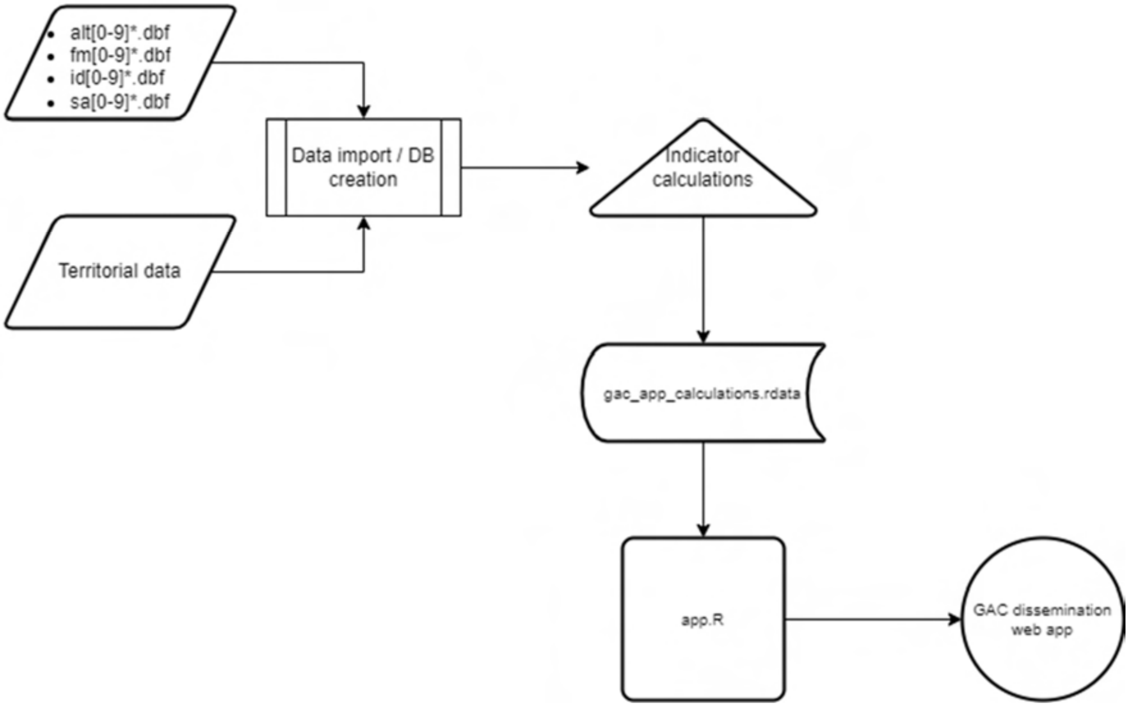
The application uses the raw data sources provided from the GAC, which are reviewed in advance by INS team.

The data is read using the main first script (i.e. **"00_*"**) provided. The data input is executed outside the application as the process is memory intensive and would make the application unstable or unresponsive. In addition, the server/computer on which the data import is run should have enough memory to finish the process (e.g. at least 24GB to also allow for other processes to be run in parallel).

After the data is imported, the second script (i.e. **"01_*"**) imports the required territorial variables and attaches these variables to the interview level database that was already imported. Lastly, the third script (i.e., **"02_*"**) calculates the INS's requested indicators according to their formulas and templates and summarizes the data at the municipality level, dropping the interview level details.

The resulting datasets are saved on to disk as in **".Rdata"** format (R native data format) to allow for fast loading and optimum size on disk (i.e. gac_app_calculations.rdata).

Figure 20 - Diagram of data inputs and calculations for dissemination



File and data structure

The app is contained in one folder that is available on the INS analytics server (RGA Export app). Since it is self-contained, it can be easily migrated. The main application script is found in the file **"app.R"**. The file **"00_data_update.R"** contains the scripts required for the first run and updates. The script also checks for the required R packages and installs these packages if these are not found. For the application's filtering section, a third party / non-CRAN package is used. This package is installed directly from Github via devtools in the same script. The folder **"R_scripts"** contains all the scripts required to import the data, clean it, and summarize it at the municipality level. These are the scripts sourced by the **"00_data_update.R"** file.

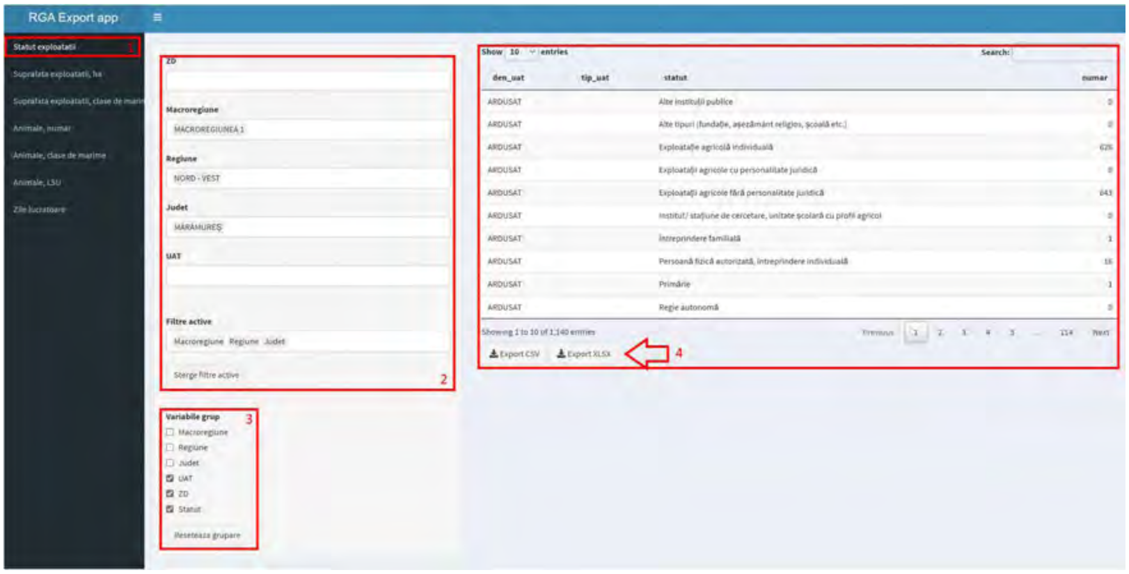
The initial version is missing the main raw data files to avoid data duplication on the server side. To update the data, the original data files are stored in the folder /original_data/BD_v2. If the actual paths are changed, the data paths should also be changed in the file **"00_data_join.R"**. The main data file used by the application **"gac_app_calculations.rdata"** is stored in the /data folder, along with any additional files required by the app and imported/created by the **"01_DBs_creation.R"** script.

5.4. Use case and update procedure

According to the INS team, the main use case is for their team to be able to respond to data requests from third parties quickly. Hence, the main use case begins with an official data request. We recommend that this type of request be a standardized form to streamline the response and reduce the time for processing the requests.

Following the data request, the operator can select the variable that will be extracted, select the territorial levels included in the report, and the grouping variables that will be used. After the application finishes the calculations, the operator can inspect the data table to check that it is correct and export it in the required format.

Figure 21 - Operator's data checks for indicators production



ZD

Macroregiune: MACROREGIUNEA 1

Regiune: NORD - VEST

Judet: MARAMUREȘ

UAT

Filtre active: Macroregiune Regiune Judet

Variabile grup
- ☐ Macroregiune
- ☐ Regiune
- ☐ Judet
- ☑ UAT
- ☑ ZD
- ☑ Statut

Show 10 entries   Search:

den_uat	tip_uat	statut	numar
ARDUSAT		Alte instituții publice	0
ARDUSAT		Alte tipuri (fundație, așezământ religios, școală etc.)	0
ARDUSAT		Exploatație agricolă individuală	626
ARDUSAT		Exploatații agricole cu personalitate juridică	0
ARDUSAT		Exploatații agricole fără personalitate juridică	643
ARDUSAT		Institut/ stațiune de cercetare, unitate școlară cu profil agricol	0
ARDUSAT		Întreprindere familială	1
ARDUSAT		Persoană fizică autorizată, întreprindere individuală	16
ARDUSAT		Primărie	1
ARDUSAT		Regie autonomă	0

Showing 1 to 10 of 1,140 entries

Updating the database used in the application is a very simple process. Again, the recommendation is that the changes are operated on the server version in an instance of the RStudio server to be consistent across all users. In this process, it is highly recommended that git should also be running on the application's folders to allow rollbacks in case of errors.

The first step in updating the data used is to push the data files to the /data/BD_v2 folder. Second, the script **"00_data_update.R"** must be run. If the data is found in another folder, the appropriate modifications should be done in the script **"00_data_join.R"**. In addition to the **“.rdata”** database used by the application, the data from each join process is stored in separate **“.fst”** files (a performant and efficient storage system, i.e. alt_db.fst, id_db.fst, fm_db.fst, sa_db.fst) in the /data folder. These can be used for further processing and reporting.

The guidelines for using the GAC dissemination application are recorded and available at https://worldbankgroup.webex.com/recordingservice/sites/worldbankgroup/recording/c1c546ecd376103a83cf005056819aa3/playback . We recommend the download and reposits by INS.

The script of application is provided as archive to this report **Annex 7 - Script for GAC data dissemination**.

6. Technical support regarding GAC data processing

6.1. Hardware and software requirements

Locally run versions of applications

While not recommended, the applications (GAC dissemination, Control Tables) can be run on any desktop computer running an R version and RStudio. Additionally, Windows and Linux versions of these software applications are all available on the CRAN and RStudio websites.

Server-based versions

For running the server-based version, the application requires a Linux server running a web server (e.g. Apache, Nginx), R-base, an Open-source version of Shiny Server and RStudio Server (mainly for maintenance and updates). Additional packages required for running the application are installed when running the initial script for the first time.

The current version of the applications are installed on the INS IT environment (on the *"Analytics server"*) and are available only through the INS VPN.

The installation of R, Shiny, etc. wasnncompleted by the INS teams under the coordination and support provided by WB team through on-the-job training. The installation sessions have been organized on-site or remotely with the GAC team and IT team members participating in the sessions. A training session on GAC dissemination took place on June 21 2022 – the recording of training session is available and delivered to INS.

6.2. Skills and operating requirements for sustainability

Short training sessions for operating the applications are provided by the WB team and are available recorded for further use of the INS staff.

As for the GAC data processing applications using specific statistical programming language R were recommended and prepared. It is however important and becomes mandatory that at the level of INS a department that deals with everything that means the R environment is established. The statistical offices that use these tools have a small unit within the IT department dedicated to R.

At the level of INS mixed teams of personnel with R programming development skills and statisticians on certain fields of interest (agriculture, social, economy, etc.) should be organized to further develop and implement R solutions and use them for statistical production.

The RStudio Server and Shiny Server could be installed for each user to use R regularly in their activity. The regular users of applications can take courses (as the ones proposed through the Multiannual Training Plan[5]) and together with the IT department could expand or improve the applications proposed.

For future surveys on agriculture the INS will apply or develop further the applications for monitoring, validation, automatic approvals/rejections, reports and dissemination considering that the workflow is very similar with the GAC2020. By that the scripts/dashboard and applications should be revised based on new metadata available for that specific survey.

[5] Multiannual Training Plan for INS staff was prepared by WB team under Output 12 of same RAS Agreement and contains mandatory or specific IT courses for statisticians, including the one on R programming language.

Annexes

Annex 1 – GAC data collection information system – As-built report

Annex 2 – Sample reports of daily monitoring

Annex 3 – Sample reports of census's staff activity

Annex 4 – Script for automatic acceptance / rejection of questionnaires

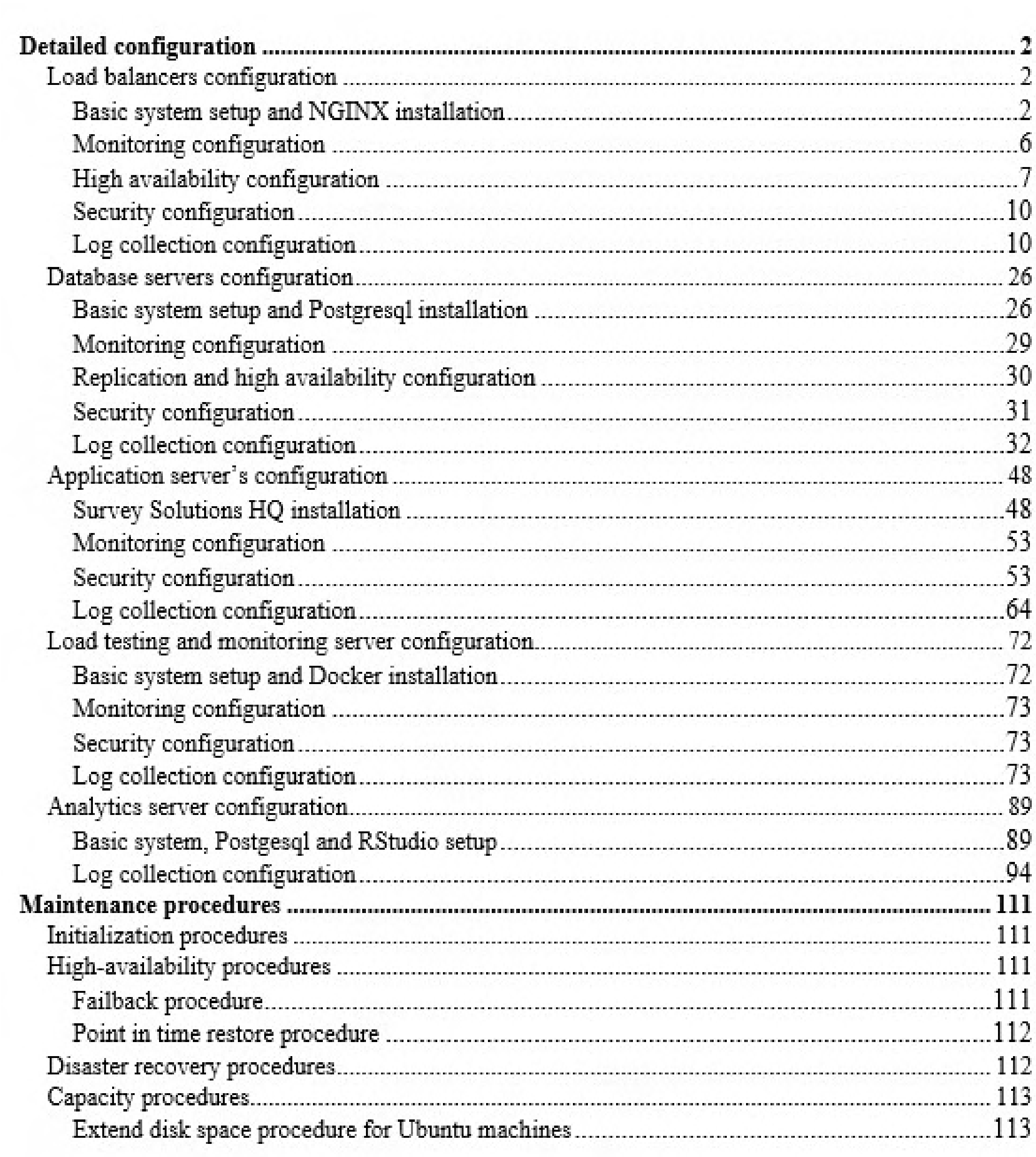
Annex 5 – Scripts of data control tables

Annex 6 – Sample of data control tables (TC no.0)

Annex 7 – Script for GAC data dissemination

Annex 1 - GAC data collection information system – As-built report

The as-built report (see below the table of contents) is provided archived with this output.



Annex 2 - Sample reports of daily monitoring

The sample of report(s) is provided archived with this report **“Reports of daily monitoring”**

monitorig_data_collection_Judete.html

monitorig_data_collection_Judete.Rmd

monitorig_data_collection_UAT.html

monitorig_data_collection_UAT.Rmd

monitorig_data_collection_UAT_chestionar.html

monitorig_data_collection_UAT_chestionar.Rmd

number_questionnaires_agregate_pe_Judete.html

number_questionnaires_agregate_pe_Judete.Rmd

number_questionnaires_NA_Judet_sau_UAT.html

number_questionnaires_NA_Judet_sau_UAT.Rmd

Annex 3 - Sample reports of census' staff activity

The sample of reports is provided in electronic format archived with this report **"Reports of census staff activity".**
The archive contains the following reports:

Table 1	Monitoring of data collection
Table 2	Monitoring of data collection by ATU, supervisors and enumerators
Table 3	Used Agriculture Area (UAA), cattle and pigs by ATU and county
Table 4	Report for payment of enumerators
Table 5	Report for payment of chief enumerators (supervisors)
Table 6	Report for payment of coordinator
Reporting package chief enumerator (zip)	Activity report of chief enumerator (descriptive) - accompanies the payment situation
Reporting package coordinator (zip)	Activity report of coordinator (descriptive) - accompanies the payment situation

Annex 4 - Script for automatic acceptance / rejection of questionnaires

The script is provided R programing software and is archived with this report ***“Script for automatic acceptance /rejection of GAC questionnaires”.***
The archive contains:

automate_rejections.R

evaluare_approval_conditions.R

read_CAPI_automate_approval_c2_v2.R

read_CAPI_automate_reject_v2.R

Annex 5 - Script of data control tables

The tables are provided in R programing software and are archived with this report **“Data Control Tables for GAC”.** The archive contains:

control_tables_tab.R

CreateCT0.R

CreateCT1.R

CreateCT2.R

CreateCT3.R

CreateCT4.R

CreateCT5.R

CreateCT6.R

CreateCT7.R

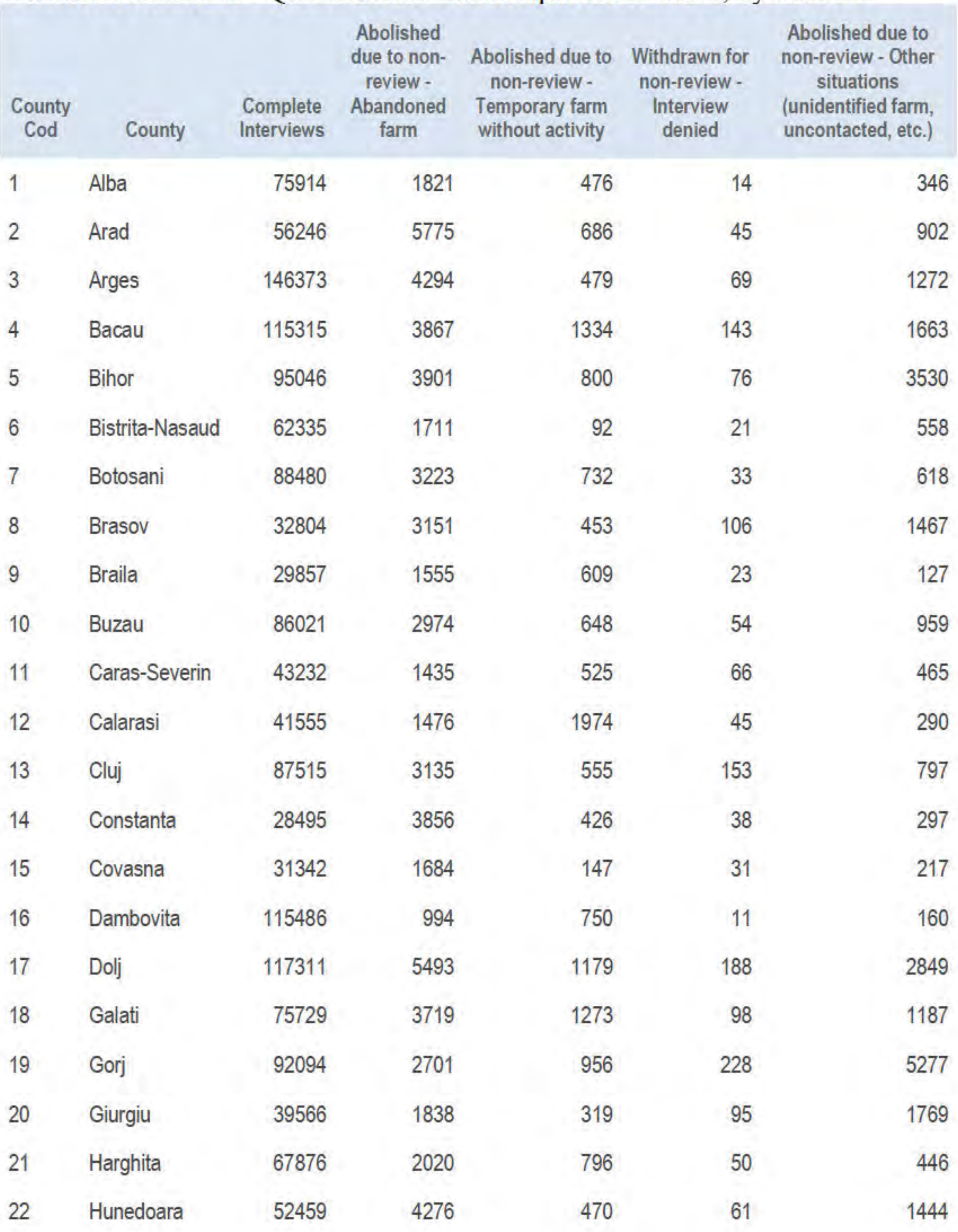
CreateCT8.R

CreateCT9.R

Annex 6 - Sample of data control tables (TC no. 0)

Control Tables
INS_WB
12/6/2021

Control Table no.0 - Questionnaires on completeness codes, by counties



County Cod	County	Complete Interviews	Abolished due to non-review - Abandoned farm	Abolished due to non-review - Temporary farm without activity	Withdrawn for non-review - Interview denied	Abolished due to non-review - Other situations (unidentified farm, uncontacted, etc.)
1	Alba	75914	1821	476	14	346
2	Arad	56246	5775	686	45	902
3	Arges	146373	4294	479	69	1272
4	Bacau	115315	3867	1334	143	1663
5	Bihor	95046	3901	800	76	3530
6	Bistrita-Nasaud	62335	1711	92	21	558
7	Botosani	88480	3223	732	33	618
8	Brasov	32804	3151	453	106	1467
9	Braila	29857	1555	609	23	127
10	Buzau	86021	2974	648	54	959
11	Caras-Severin	43232	1435	525	66	465
12	Calarasi	41555	1476	1974	45	290
13	Cluj	87515	3135	555	153	797
14	Constanta	28495	3856	426	38	297
15	Covasna	31342	1684	147	31	217
16	Dambovita	115486	994	750	11	160
17	Dolj	117311	5493	1179	188	2849
18	Galati	75729	3719	1273	98	1187
19	Gorj	92094	2701	956	228	5277
20	Giurgiu	39566	1838	319	95	1769
21	Harghita	67876	2020	796	50	446
22	Hunedoara	52459	4276	470	61	1444

County Cod	County	Complete Interviews	Abolished due to non-review - Abandoned farm	Abolished due to non-review - Temporary farm without activity	Withdrawn for non-review - Interview denied	Abolished due to non-review - Other situations (unidentified farm, uncontacted, etc.)
23	Ialomita	37915	1754	606	51	577
24	Iasi	103569	8711	1649	286	3057
25	Ilfov	20019	3226	138	64	1000
26	Maramures	96158	6019	486	143	1656
27	Mehedinti	63291	2212	389	131	424
28	Mures	83186	2114	297	23	223
29	Neamt	97126	5428	1315	71	1106
30	Olt	94310	2135	470	72	823
31	Prahova	121733	1747	528	62	579
32	Satu Mare	53759	3049	1022	69	852
33	Salaj	54452	2966	710	27	2137
34	Sibiu	42420	4224	918	101	1343
35	Suceava	147702	1879	343	90	1151
36	Teleorman	52287	3951	1248	160	2114
37	Timis	57851	3309	1036	173	947
38	Tulcea	31012	1356	1128	99	1978
39	Vaslui	104089	828	58	38	234
40	Valcea	78089	3209	5697	23	1691
51	Vrancea	87047	4269	325	61	1481
52	Municipiul Bucuresti	565	176	35	5	117
NA	NA	1	2153	147	73	838
	TOTAL	3007632	129614	34224	3470	50968

Annex 7 - Script for GAC data dissemination

The script is provided archived with this report ***"Script for GAC data dissemination".***

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Reimbursable Advisory Services Agreement on
Romania Capacity Building for Statistics (P167217)

OUTPUT No. 14

(ii) Report on advisory services provided to Recipient on piloting of the GAC IT application with report and assistance, and advice on best practices and guidance for the maintenance processes and actions of IT system during the go-live production

June 2022

Revised version July 2022

THE WORLD BANK
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for Administrative Capacity 2014-2020

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List of Acronyms

ASA	Structural survey in agriculture
API	Application Programing Interface
APIA	Agency for Interventions and Payments in Agriculture
CAPI	Computer-assisted personal interview
CAWI	Internet-computer-assisted web interview
DPS	Data Processing and Storage
DTS	Territorial Statistics Directorates
EC	European Commission
ESS	European Statistical System
EU	European Union
EUINSPIRE	Infrastructure for Spatial Information in the European Community
GAC2020	General Agricultural Census, round 2020
GEOLOC	Geographical Location Software Application
GIS	Geographical Information System
GPS	The Global Positioning System
INS	National Institute of Statistics
IT	Information technology
LSU	Livestock Unit
MADR	Ministry of Agriculture and Rural Development
MAI	Ministry of Internal Affairs
MDC	Mobile Data Collection
PHC21	Population and Housing Census in Romania in 2021
RAS	Reimbursable Advisory Services
STS	Special Telecommunication Service
SuSo	Survey Solutions
UAA	Utilized Agricultural Area
UAT	Administrative Territorial Units
UN	United Nations

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Introduction

The purpose of this report is to present the piloting process for the GAC2020 in the context of preparing the census for roll-out and production stage in 2021 (May-July), based on the European and national legal framework for the 2020 round of the agricultural censuses of the member states and based on the Survey Solutions System**.** This is part of the deliverables under the Reimbursable Advisory Services (RAS) Agreement on *Romania Capacity Building for Statistics (P167217).* The project is implemented by the National Institute of Statistics (INS) with support from the World Bank.

This report is direct related with report delivered as Output 2a[1] under same Project and was prepared following discussions with management and staff from the INS, including the President and those who are principal actors in the organization and implementation of the 2020 round of census.

The purpose of piloting the GAC was to verify, on a lower scale, the institutional, organizational and logistics set-up and observe the potential miss-functionalities or shortcomings of the entire process, in order provide recommendations for improvement, fixing or for maintenance during the go-live production of census. The piloting process was driven by the four characteristics of GAC2020, which require optimized instruments, respectively: i) a fully electronic data collection; ii) fully geo-referenced data collected; iii) continuous quality management applied at each stage of the data collection process; iv) the full population of agricultural holdings covered, according to the specificities of the Romanian agricultural sector.

The need for a GAC piloting process was driven by the objective of the actual census, namely to collect and provide quality and comprehensive information in an internationally comparable way for around 300 variables concerning the number of farms, area of land used for agriculture, numbers and characteristics of persons carrying out agricultural activities, numbers and characteristics of animals, rural development, etc., The GAC2020 is the largest statistical operation conducted by the INS for collecting, processing and disseminating data on the structure of the Romanian agricultural sector.

This document has five sections. The first section provides an overview of the GAC piloting process in the view of the institutional arrangements, organizational aspects and expected data collection and specific variables.

The second section describes the activities designed for the pilot and presents its limitations together with the GAC IT infrastructure (hardware and software) put in place. The detailed description of the specific set-up for the software operation systems and applications is presented in the annexes (section five) for eventual further application.

Section three is a comprehensive summary of the results of the GAC pilot, comparing the recommendations provided in Output 2a and the lessons from the implementation of the pilot. The assessment of the achievements and shortcomings formed the basis for the recommendations for actual GAC go-live production, described in section four, which covers the revised and adjusted workflow, the IT infrastructure for a smooth data collection process (servers and operation systems, tablets set-up and configuration, technical call center), the training and the promotion and communication components for the actual General Agriculture Census.

Section five consists in annexes presenting the detailed configuration and the maintenance procedures of GAC IT environment for actual census.

[1] Output 2a - *Report on advisory services provided to Recipient on the proposed solution for the modernization of the GAC2020 data collection, 2020 September*

1. The context for the GAC 2020 pilot

The agricultural census is the only data collection instrument that produces statistical information on the structure of all agricultural holdings. To obtain data on the population of all agricultural holdings of Romania the GAC2020 had thus to cover the whole farming sector. The pilot for the GAC was organized based on decisions of the Central Commission for the GAC and in line with the provisions of Government Emergency Ordinance (GEO) 22/2020 regarding the organization and implementation of the GAC. The period of organizing the pilot data collection for GAC was 12 – 23 October 2020.

The preparation and piloting of the GAC aimed to follow the recommendations presented in report Output 2a, however the focus was on testing the CAPI process and the functioning of the IT system. An activity plan for the pilot was developed and applied, having in mind that it was important for the pilot to be carried out (almost) the same way as an actual census2.

The purpose of the GAC2020 pilot was to test the environment for the census and identify issues that were not working properly so that timely remedial action could be taken. For example, it was recommended to test the questions in terms of clarity of wording and instructions for answers, the data collection through the questionnaire, using as many types of farms as possible, the time required to complete the questionnaire, etc..

The pilot census did not produce usable and disseminable data, the focus was on the process and the analysis of the errors in the collected data to identify and remedy problems.

In this context, the GAC2020 pilot census considered testing the following steps:
a) Organization of the GAC2020
- Roles of the census and supplementary staff
- The flow of activities between headquarters and territory
- Staff training
- How to use the tablets
- The reaction of the population

b) Data collection and transmission, processing and storage
- Pre-loading the identification data in the questionnaire
- Structure and content of databases
- How the tablets work
- Use of paradata
- Troubleshooting

c) Integrated IT infrastructure operation, dedicated to both GAC2020 and PHC2021
- Application operation
- Evaluation of the necessary IT resources

For the preparation, organization and oversight of the GAC2020 pilot, the following main activities were carried out:
- Setting-up the methodology for organizing the pilot census and sectoring the territory
- Selecting the agricultural holdings where the test census was carried out
- Designing the electronic questionnaire for data collection (CAPI)
- Preparation of instruments for staff training
- Staff training - statisticians and enumerators
- Organization of activities at local level (census commissions and secretaries in counties and census commissions in UATs)

[2] Since this is the only pilot, it is highly recommended to not deviate too much from the actual census process.

- Preparing the IT system for the test
- Preparing tablets - SoSu installation, loading questionnaire, defining users and passwords
- Defining the messages and how to promote the pilot census, including notification of selected agricultural holdings
- Data collection
- Verification of completeness of records and validation of data
- Assess the IT infrastructure and the extent to which it has met the demands
- Analysis of test results and identification of areas for improvement
- Proposals to remedy the malfunctions.

The following chapters are detailing the main topics presented above.

1.1. Institutional arrangements

In brief the institutions involved in piloting the GAC were INS, MADR, MAI, STS and they followed the mandates described in the primary and secondary legislation dedicated to the GAC preparation and implementation.

The INS (headquarter and DTS) was involved in the pilot process by covering and implementing the activities related to data collection preparation, sectorization, selecting observation units and testing the Survey Solution functionalities customized for GAC data collection.

The STS provided and hosted the IT infrastructure, supported the installation and configuration of it, provided tablets, and communication, cyber security testing and validation for GAC.

The MADR provided the administrative data sources from APIA uploaded into the electronic questionnaires. The MAI provided organisational support through the census commissions at county and UAT level.

Advisory services for the Survey Solution implementation and configuration, the transformation of the questionnaires in electronic ones, the testing and monitoring of the GAC pilot were provided to INS by the World Bank.

1.2. Organizational aspects

According to the EU Regulation 2018/1091, Romania has to ensure the minimum degree of coverage for UAA or LSU, using a sample of at least 10% of the number of agricultural holdings remaining outside the framework. However, the member states can exhaustively research agricultural holdings outside the framework, i.e. located below the thresholds specified by Regulation 2018/1091, from the needs arising for certain characteristics of national interest. According to the conclusion based on the advantages and disadvantages presented in Output 2a the General Agricultural Census 2020 would be carried out exhaustively (from all observation units in Romania) for the basic structural features and modules.

The pilot census approach was the following:

a) a full enumeration and geo-referencing of the pilot regions/sectors.
    - after the segmentation a sample of holdings from all regions/counties were selected for the pilot census.
    - the selected holdings had a similar distribution of the census units as it was expected in the main census.

  - the organizational structure at the national and the territorial level was the same as in the main census (i.e. communications & user support, IT support etc.)

b) the pilot frame must be a representative replica of the actual census frame with respect to the final census units, thus including:
  - agricultural holdings with legal personality (including APIA holdings)
  - agricultural holdings without legal personality (including APIA holdings)

About 4,500 agricultural holdings (farms) participated in the pilot census, selected from about 150 UATs from all 42 counties of the country (including Bucharest municipality), in different geographical areas, according to a series of criteria that would allow a first check as complex as possible of the organization and stages of the development of the census statistical tools.

For each county agricultural holdings with and without legal personality were selected, located in the neighboring locality to the county capital as much as possible, so as to cover a wide range of types of farms that use agricultural land and/or keep livestock. However, due to pandemic context, the distribution of selected holdings was not quite similar with the actual census, but an equal number of units was selected from each county.

Each county technical secretariat received information about the selected UATs and farms at county level.

1.3. Coverage and variables

The questionnaire prepared for the GAC pilot covered 295 variables compared with the maximum recommended 300 (common variables for all EU member states), which should be collected for the EU Regulation[3] purposes by the GAC 2020 (variables which were not significant for Romania's agriculture were not covered).

The categories of variables used during pilot were the core structural data (general variables; variables of land; variables livestock) - 180 variables; module data: labor force and other gainful activities (30 variables); rural development (15 variables); animal housing and manure management (70 variables).

A number of supplementary variables were added to those requested by EU Regulation, for national purposes.

For data that must be provided to the Eurostat, the GIS coordinates of the holding had to be allocated using "the cell code of the INSPIRE statistical units' grid for pan-European usage"4. The pilot allowed INS, to verify the different Address Canvassing and Sectorization strategies, since the GAC2020 census most likely will not use any administrative segmentation or an area frame, but geo-graphic coordinates derived from data collection, an internal address database or any other source. To test the recommended strategies, ground verification was important and to also consider areas with different geo-graphical structure.

[3] Most of these variables are included in the EC-provided list and subsequent descriptions (Regulation 2018/1091 Annex III).

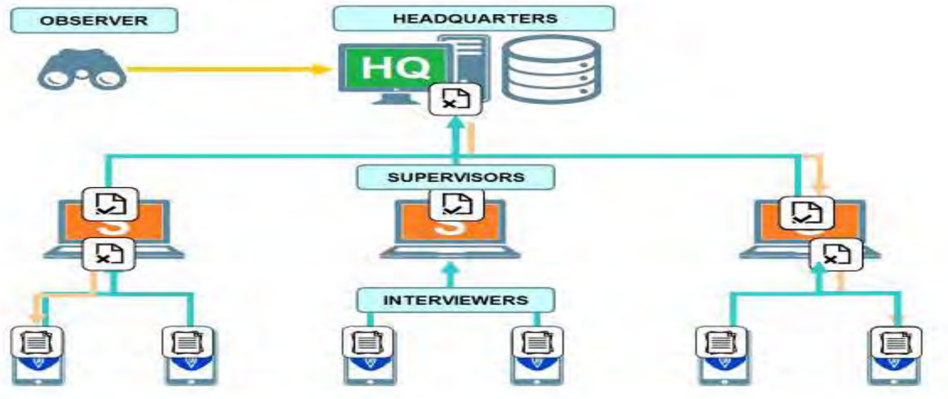
[4] This refers to 1x1 km grid where the farm is located and will be used only for transmission process. However, the EC Commission Implementing Regulation 2018/1874 states that "for data dissemination purposes, in addition to the normal disclosure control mechanisms for tabular data, the 1 km grid will be used only if there are more than 10 agricultural holdings in the grid; failing that, nested 5 km, 10 km or larger grids will be used as required."

2. Components of the piloting process for GAC2020

The combination proposed for GAC2020 in Romania includes a digital questionnaire and face-to-face interviewing, the CAPI data collection method. The GAC pilot was conducted by INS (headquarters) with the support of DTS in 42 counties during 12 days with a total number of 84 enumerators using tablets for data collection and 42 supervisors using PCs (laptops).

The CAPI field work structure applied during GAC pilot was on the conventional Survey Solutions configuration, Figure 1 below.

Figure 1- CAPI field work structure



Source: Authors (Output 2.a)

2.1. Activities of the pilot

The piloting process, including here the preparatory, running and processing the data components of the questionnaires, followed a set of activities planned during August – October 2020, as they are presented further.

The following special conditions were considered for the preparation of the GAC2020 pilot census:
a) the restrictive conditions and protection measures imposed by the evolution of the COVID-19 pandemic
b) the draft decision of the Romanian Government regarding the budget and the categories of expenses for GAC2020 ; as the decision was approved in December 2020, after the pilot census moment the data collection was done with DTS staff exclusively.
c) the framing of the pilot between two electoral periods of national importance in which the staff of the INS and of the territorial statistical directorates were engaged.

2.1.1. Selection of the pilot regions

The statement of objectives was defined by specifying the information needs and pilot targets recommendations and this component included:

- Definition of the target regions for the census (i.e. which territorial offices/ATU) based on the latest available agricultural data (i.e. farm structure survey).

- Definition of the pilot population size based on statistically valid sample sizes/designs, to address all pilot requirements, including testing of the IT infrastructure.
- Informing participating territorial offices and requesting farm registers[5] for the selected ATU.
- Data cleaning & quality assessment of retrieved data.
- Defining the pilot population based on the available sampling frames (i.e. APIA and farm register from counties).
- Other administrative sources, if available
- Pilot census preparation in counties from an administrative and organizational point of view

As for clarifying the process, several aspects were adjusted: a simple selection of holdings taking into account economic size, typology and geographical criteria (as grouped as possible - due to restrictions of traveling and human resources) was used. The selection of the holdings to be enumerated during pilot census was finalized by INS.

To define the pilot population the farm register placed at INS headquarter was used, and the APIA holding list and the administrative register were used for defining the holdings surveyed in the actual census.

All the counties /territorial offices were involved in the pilot and all local census commisions were informed.

The specifications and requests related to the system's architecture for the pilot were provided by the World Bank to STS, who agreed and confirmed aspects related to IT infrastructure for GAC (and PHC) pilots, and that the pilots would not be conducted on the same infrastructure as the actual census (according to information available in 2020).

2.1.2. Address Canvassing & Sectorization

This component included:

- the frame data address information connected to data base of geographic coordinates (i.e. APIA or other)
- the segmentation of units into comparable sized enumeration areas to maintain similar workloads[6] with available geographic coordinates and/or topology information.

Several aspects were clarified during the piloting process, including that all units required location information (GPS when segmentation was done by geographic location, otherwise segmentation could only be done by using administrative boundaries), respectively that the location (geographical) information would be covered by data collection and complementary information from the APIA database and GeoLoc2 database for all holdings.

2.1.3. Resource planning & preparation

This component consisted in:

- Staff selection at national (i.e. IT support, census hotline) and territorial office (i.e. local support) and development of training programs;
- Time period (if possible similar to the census period, but at least 5/7 days in a row)
- Number of tablets required (same technical specifications tablets as for main census)

[5] Testing of the AC&S is a crucial element of this pilot
[6] May include other segmentation criteria

The pilot should contain all elements of the actual census, the whole support infrastructure, including staff and attributions based on their roles, to use and apply the functionalities of the system. INS and DTS hired additional staff under national law, but some delays in approving the GAC budget legislation led to the impossibility of hiring enumerators and chief enumerators (supervisors) for the GAC pilot. Thus, the pilot was limited to data collection and checks of the tools available for it. The content related training programs were developed and conducted by INS, and the application related training was developed by the Work Bank and INS teams and conducted by INS (e.g: tutorials on Survey Solutions, other training aspects).

Since the Decision of the Romanian Government regarding the budget and the categories of expenses for GAC2020, as well as the establishment of the measures regarding the implementation of some provisions from GEO no. 22/2020, was not approved before October 2020, this had a number of consequences on the organization of GAC2020 pilot census and several reorganization measures were imposed, as follows:

- the staff of the territorial statistical directorates was used for data collection
- the roles of chief enumerator (supervisor) and coordinator was tested with the help of staff from the territorial statistical directorates
- the messages and measures to promote the pilot census, including the notification of the selected agricultural holdings, was be carried out by MADR in collaboration with the INS taking into account the available financial resources

The number of IT tablets used for the pilot was obviously smaller than for the actual census and the technical specifications similar not identical - in fact tablets to use for actual census will include models used for pilot but also other models bought later in 2020/2021.

2.1.4. Sample creation

This component consisted in the following:

- Selection of final segments - selection and complete coverage of whole segments was recommended.
- For verification purposes of the AC&S strategies, complete basic information is required for a certain number of segments.
- Final definition of required domains (if different to first step, adjustment of sample size).
- Creation of strata based on segment data - mostly from geo-spatial resources and possibly coverage information.
- Selection of final segments.

For the sample creation an approach which should be a full replication of the actual census and should reflect as much as possible the true situation on the ground and avoid purposeful selection of holdings (not recommended) was considered. Nevertheless, sampling and grossing-up was not applicable for the pilot or for actual census considering a full enumeration will be applied (no sampling needed). An equal number of sectors were tested in every county. In support of this approach was the fact that the pilot of GAC was a test from the point of view of the proper functioning of the IT applications, the hard infrastructure, the verification of human capabilities – field personal, INS and DTS staff, the final database, etc. - the value of the harvested indicators was not followed, i.e. it did not matter how much wheat or corn was obtained after the pilot survey.

2.1.5. Questionnaire design and quality control

The steps considered were:

- Final in-house test of questionnaire application(s) on the same tablets as used in the census with focus on the required balance between data quality and efficiency.
- Finalization of CAPI questionnaire.
- Preparation of pre-filling information, including administrative resources.
- Creation of training and support materials (i.e. instruction videos, interviewer/supervisor training materials).
- Creation of different questionnaire versions for testing purposes (i.e. should be reflected in sample size considerations).

The clarification of this phase considered the pre-filling process which required a feasibility analysis phase, with advantages and disadvantages, taking into account the national specifics of the agricultural land fragmentation. Supplementary, the available pre-filling information (i.e. information from the APIA database) was assessed on its quality and usefulness in order decide on what was going to be used.

In terms of the application related materials, they were prepared by the World Bank, either for in-person training or for remote training, depending on the pandemic evolution.

2.1.6. IT and tablet set-up

This component included:

- Creation of data collection server & data processing infrastructure.
- Development of support materials (i.e. tablet set-up instructions, local support manuals).
- Defining the different roles of the staff in management of the questionnaires, control and corrections.
- Basic IT infrastructure functionality tests.
- Management of the tablets at the county level.

All application and technical documentation were provided by the World Bank based on Survey Solution specifics for using in GAC and installed on the hardware infrastructure (servers and tablets) and communication of STS. (see also item 2.3)

2.1.7. Data collection

This component included:

- Training of field staff.
- Distribution of workload to teams (decentralized) or to individual enumerators (centralized).
- Synchronization test.
- Contact attempts.
- Collection of additional paradata (incl. geo-spatial).
- Close supervision of the whole data collection process.
- Full application of quality control and support infrastructure.

The training was carried out between October 7-8, 2020, in a webex system. The staff from INS and DTS involved in RGA activities participated. The training addressed organizational issues, issues related to the configuration of tablets and the use of the Survey Solutions (SuSo), methodological issues and completion of the electronic questionnaire.

The following were also sent to DTSs:

- Instructions for setting up tablets and installing Survey Solutions (SuSo)

- The enumerator's manual
- Video instructions for using the Lenovo tablet by the reviewer and the GAC questionnaire in SuSo

2.1.8. Documentation

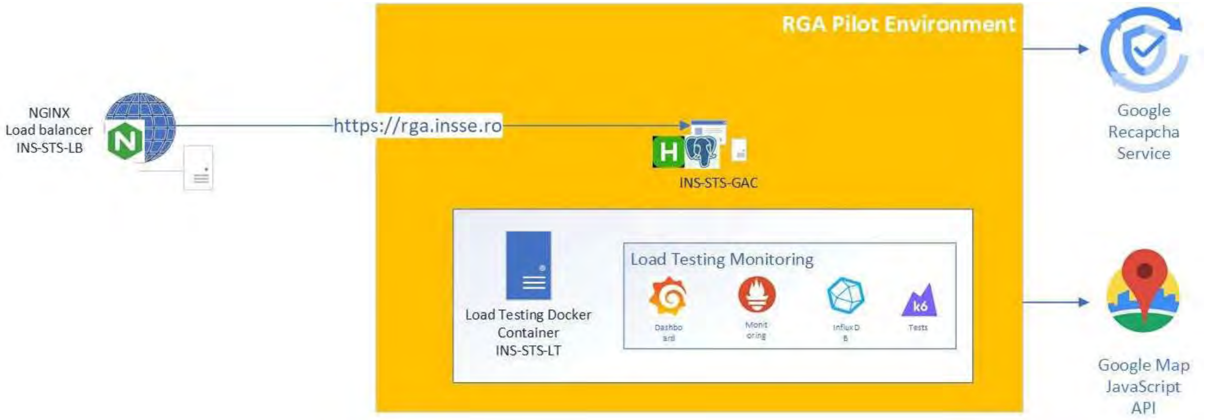
This component was targeted for the intended audience (management; Government; technical staff; education/NGO; Eurostat/ESS) and considered:

- Different pilot part of reports (i.e. Questionnaire, IT, interview process);
- Instruction manuals (e.g., usefulness for field staff and statisticians);
- Assessment of IT infrastructure;
- Assessment of all support infrastructure;
- Feedback from field staff;
- Final Specifications for systems programs;
- Recommendations for main census staff.

2.2. The GAC pilot IT infrastructure (hardware and software) set-up

The infrastructure for the GAC pilot was provided and hosted by the STS in terms of data collection using the CAPI method. The statistical production and monitoring processes were supported by the World Bank. The pilot environment is presented in Figure 2, below.

Figure 2 - GAC pilot environment



The configuration of the IT infrastructure and the installation of applications were performed by specialized experts under some constrains related to the Romanian regulations protected by the STS procedures:

- Only persons with a proper clearance level issued by the Romanian authorities were authorized to access hosted STS environments.
- Accesses through Internet to pilot frontends were possible only from locations inside the Romanian territory.

No particular risks were identified. Still, security best practices were followed in the installation process and updates were applied to the latest version of the installed components. The overall systems passed the STS verification, with the only mention to protect the web access to the applications by implementing a defence mechanism, in this case a captcha component – and for this purpose Google Re-Captcha was used.

2.2.1. GAC pilot IT hardware

The GAC pilot was run on virtual machines provided by the STS in the specifications proposed by the World Bank as required resources for appropriate functioning of Survey Solution – see Table 1, below.

Table 1 - GAC IT environment specifications

Virtual Machine	vCPUs	RAM	Disk Space
INS-STS-LB	4	8GB	25GB
INS-STS-GAC	32	16GB	500GB
INS-STS-LT	16	48GB	50GB

The GAC pilot environment consisted of a single Windows 2019 virtual machine with both Survey Solutions and PostgreSQL 12 installed. It exposed a web interface on port 9700 to the load balancer for requests to https://rga.insse.ro and communicated internally with the database on standard port 5432. The Windows Server 2019 license used was a trial one, a situation which had to be changed for the actual census to a perpetual license.

2.2.2. Implemented solution summary

The GAC pilot environment was built on a virtual server, following recommendations from the World Bank Survey Solutions - https://support.mysurvey.solutions/faq/server-requirements.

All end-user access to the systems interfaces were made via the web. INS-STS-LB virtual server served as the main load-balancer where requests were directed to respective system (GAC Headquarters application) or balanced within different system (e.g. PHC Headquarters application) in order to support high load.

The virtual machine (INS-STS-GAC) served as a functional testing environment for the GAC. The virtual machine was provisioned with a Survey Solution Headquarters application instance and a PostgreSQL 12 database.

2.2.3. Load balancer

The Load Balancer component on the INS-STS-LB was based on NGINX 1.18.0 installed on a CentOS Linux release 7.8.2003 system. The NGINX software was built from the source in order to include some non-standard modules including sticky_module and http_stub_status. The source was the open-source version of NGINX (https://nginx.org/en/).

Three configuration sections were dedicated for each web front-end within the two environments: rga.insse.ro (used for accessing Survey Solutions Headquarters application for RGA) and recensaminte.insse.ro (used for accessing Survey Solutions Headquarters application for RPL), rpl.insse.ro (used for accessing Self-Registration Portal for RPL)

All the configurations used HTTP to HTTPS redirect in order to enable only secured connections. Web Server SSL certificates were installed using CertBot Let's Encrypt client. Automatic renewal was enabled as long as Let's Encrypt Servers were able to reach web front-end addresses.

For monitoring purposes, the http_stub_status module was activated in order to allow publishing metrics to monitoring systems. Also, for monitoring purposes, a node-exporter application was installed in order to export metrics related to system itself.

2.2.4. Survey Solutions web application

The Survey Solution application was provided by the World Bank. The application was installed on one node with Windows Server 2019 Version 1809.

The application instance was configured to respond to http requests on port 9700. The application instance was connecting to the "SurveySolutions" database on same INS-STS-GAC virtual machine on default port 5432.

Other communications needed by the applications required connection in order to:

- Connect via Internet to Survey Solutions Designer service
- Connect to Google Re-Captcha service for user authentications
- Connect to Google JavaScript Map API

The Survey Solution application was installed from the World Bank Survey Solutions web page. A description of the Survey Solutions versions features can be found at https://support.mysurvey.solutions/release-notes.

2.2.5. Load Testing Docker environment

The load testing environment was hosted by the INS-STS-LT machine having CentOS Linux release 7.8.2003 system, where Docker was installed from the official Docker repository corresponding to the operating system version.

The load testing environment was cloned from Github's Survey Solutions official "loadtest" project - https://github.com/surveysolutions/loadtest managed by the World Bank. It consisted of four components which were deployed in the same containerized virtual network:

- Grafana, which served as a Monitoring dashboard
- InfluxDB, which served as a database for recording monitoring events
- Prometheus, which was the main events collector, gathering event data from agents deployed on virtual machines or containers
- K6 tool, which was the customizable performance tool able to generate virtual users and requests to the systems being monitored

2.2.6. Monitoring solution – Prometheus

Prometheus was deployed on a container node within Docker environment. It was exposed on port 9090 on the container node, which was also mapped on INS-STS-LT machine 9090 port.

Prometheus was configured in order to gather information from different targets:

- Linux systems metrics (CPU, Memory, Disk usage) from hosts INS-STS-LB and INS-STS-LT using node-exporter agent installed on those machines which exports metrics on port 9100
- Windows systems metrics (CPU, Memory, Disk usage) from host INS-STS-GAC using win-exporter agent installed on those machines which exports metrics on port 9182
- Specific load balancer metrics for NGINX captured form NGINX's http_stub_status module and published by INS-STS-LT machine on port 9133

- Specific Survey Solutions application nodes metrics exposed by the application on same 9700 port on “/metrics” path.

2.2.6.1. Monitoring dashboard – Grafana and InfluxDB

Grafana was deployed on the same container node used for monitoring, in the same virtual container network. It used InfluxDB for metrics data recording. Another node had InfluxDB deployed.

Within the scope of this project, two dashboards were customized in order to reflect required capabilities to monitor. The two dashboards are depicted here:

Figure 3 - Dashboard headquarters

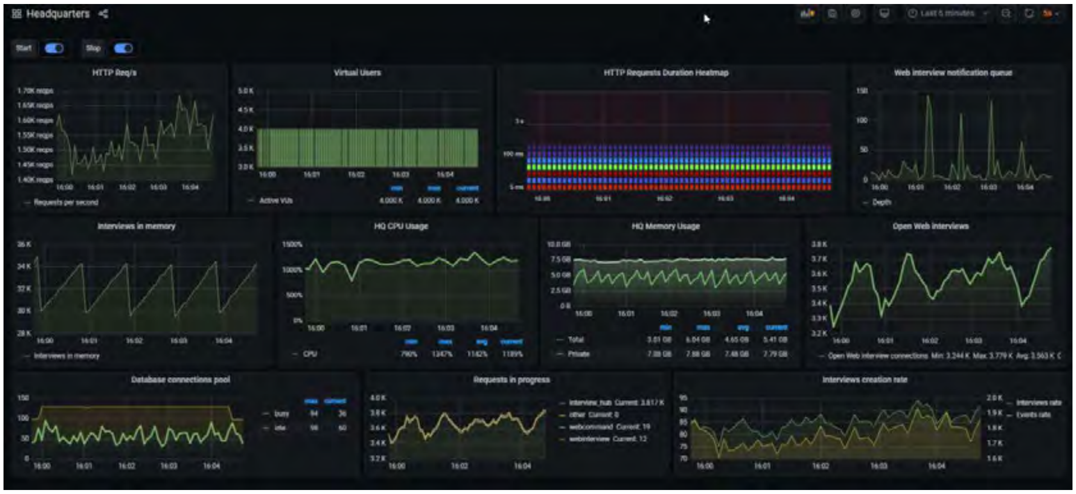
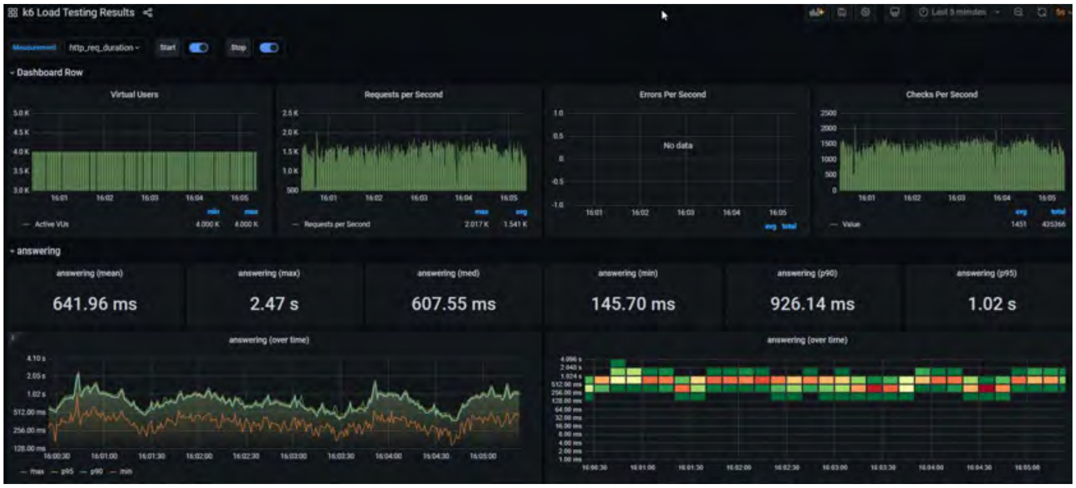


Figure 4 - Load testing dashboard



Grafana was exposed on port 3000 which was mapped to port 80 of Docker host and connected on port 9090 on the Prometheus node, which was defined as data source for the Grafana dashboards and exposed those dashboards on a rich featured visualization space.

2.2.6.2. K6 load testing solution

Load testing scripts were composed using K6 tool which enabled composing java scripts to be used exclusively for load testing. Load test script was executed within the Docker container environment. More details about the script can be found at https://github.com/surveysolutions/loadtest#load-test-script.

2.2.7. Solution detailed configuration

The detailed configuration of the GAC environment is presented in **Annex 1**, covering the load balancing installation log, the data base installation log, and the Survey Solution installation log.

2.2.8. Maintenance procedures for the GAC environment

In order to maintain a functional testing environment for GAC, some relevant procedures are required**.** Those procedures consist in:

- Initializing the environment
- Patching and updating the World Bank software when functional issues are addressed in the source code
- Monitoring the environment

Detailed instructions are presented in **Annex 2.**

In order to be able to run those procedures, a VPN connection is required to the GAC environment, hosted by STS.

3. Results of the GAC pilot

The piloting of the GAC was affected by the pandemic situation in Romania. In order avoid the infections, a limited number of persons were involved in the process, effectively using the tablets and proceeding to the enumeration process in the field.

Given that, as of 1 October 2020, the number of cases of Sars-CoV-2 virus infection in the country increased significantly, after consultation with representatives of the territorial statistical directorates, the following decisions were taken:

- the sample size and the way of data collection were adapted according to the situation generated by the infection rate of Sars-Cov2 at the level of each county, including in the localities selected for the pilot census.
- GIS coordinates have been collected, where possible, by traveling to the premises/registration place of the agricultural holding, without direct contact between the enumerator and representatives of the agricultural holding.

The pandemic evolution in Romania restrained the pilot CAPI data collection to 3,736 exploitations effectively enumerated, from a total of 4,615 included in the pilot frame. The questionnaires collected were 3,736; completed 3,736, validated 3,736, 879 nonresponse (unidentified, uncontacted etc). Given these, a comparative situation of the implemented actions between the ones described in Output 2a and the pilot offered the big picture and mandatory actions for the actual census – see Table 2.

Table 2 - Comparative GAC designed process vs actions implemented

GAC2020 data collection modernization		
Recommendation	**Pilot implementing (integral/partial/not)**	**Observations/Context regarding pilot**
CAPI approach	**integral**	**Limited to a sample of_ farms**
Survey Solution structure for data collection	**integral**	**The SuSo was used only for enumerator and HQ roles; the role of Supervisor was tested on PC,** **The observer role was not set in the field for the pilot (it is an optional role)**
IT and data infrastructure	**partial**	**At the time of GAC pilot, the IT infrastructure was under the process of procurement documentation development and was not in place for pilot. Trial Windows Server 2019 licenses were used.**
Hardware (servers, tablets)	partial	The IT infrastructure used was the one provided by STS for data collection with specifications set for a piloting process (RAM, Storage, CPU, etc.), including the tablets; specific for pilot was the use of PCs (personal computers/laptops) by the supervisors, instead of tablets, as will be the case for actual GAC.
Software	partial	The Survey Solutions and GAC questionnaire were used; monitoring dashboard and database

GAC2020 data collection modernization		
Recommendation	**Pilot implementing (integral/partial/not)**	**Observations/Context regarding pilot**
		for production were used in a hosting mode by the World Bank with no access for INS staff;
Operating systems	integral	The installation and configuration process were integrally defined and applied for GAC.
Database management systems	partial	Database for production was used in a hosting mode by the World Bank with no access for INS staff;
Applications for data collection	integral	Survey Solution designed for GAC pilot and Questionnaire were used
GIS including mobile GIS	Yes	The feature was used during the pilot, GPS coordinates were collected for some farms. The collection was made at home to the head of the agricultural holding
Navigation applications	Not	The feature was not used during the pilot
Workforce management	Not	The workforce management was not run during pilot (timesheets, reports of work completion and payment); data from SuSo is exported regarding the workforce management;
Operations management	partial	The roles of Observer were not applied during pilot
Time and expense reporting	partial	The reports are designed but a specific application is not considered and designed for GAC; data from SuSo is exported regarding the time reporting
Location tracking/monitoring for operational efficiency.	Not	The feature was not used during the pilot
Data transmission	**partial**	**Components of data transmission were not in place for pilot**
Mobile Data Collection (MDC)	Integral (partial)	For the pilot were used 1000 tablets; Online data transmission / reliable internet and Offline capability were tested
Data processing and storage (DPS)	partial	Database for production was used in a hosting mode by the World Bank with no access for INS staff;
Technical Call Centre	Not	A dedicated center was not set-up and used during the pilot
Plot location	Not	The feature was not used during the pilot
Management and governance structure	**partial**	**A limited number of management structures was piloted**

GAC2020 data collection modernization		
Recommendation	**Pilot implementing (integral/partial/not)**	**Observations/Context regarding pilot**
Central management structure	partial	INS played the role of HQ, but no Observer in place; MADR not involved in pilot data collection
Territorial management structure	partial	DTS played the role in the territory, but no other (coordinator) was in place;
Human resources	**partial**	**Three out of four roles have been allocated for pilot**
Applied roles and responsibilities of census staff	partial	Only three roles were applied (enumerator, supervisor and headquarter)
Training of census staff	partial	Training was provided by INS using tutorials of Survey Solutions, but not for all features or functionalities;
Promotion and communications	**Partial**	**Information materials have been posted on the INS website, DTS, leaflets were made, also posted in some agricultural shows it was mentioned about conducting the sample census**
Promotion campaign	Not	The promotion campaign was limited due to small scare of pilot and the lack of budgetary resources.
Call Center for respondents	Not	The call center was not active for the scale of pilot;

As the scope of pilot was to replicate at small scale the actual census, and mainly to test the CAPI data collection model using Survey Solution and questionnaire developed for GAC, it can be considered that the achievements led to the recommendations for improvements or changes at the level of preparing and implementing the process for the 2021 go-live process.

The recommendations are presented in section four of this report.

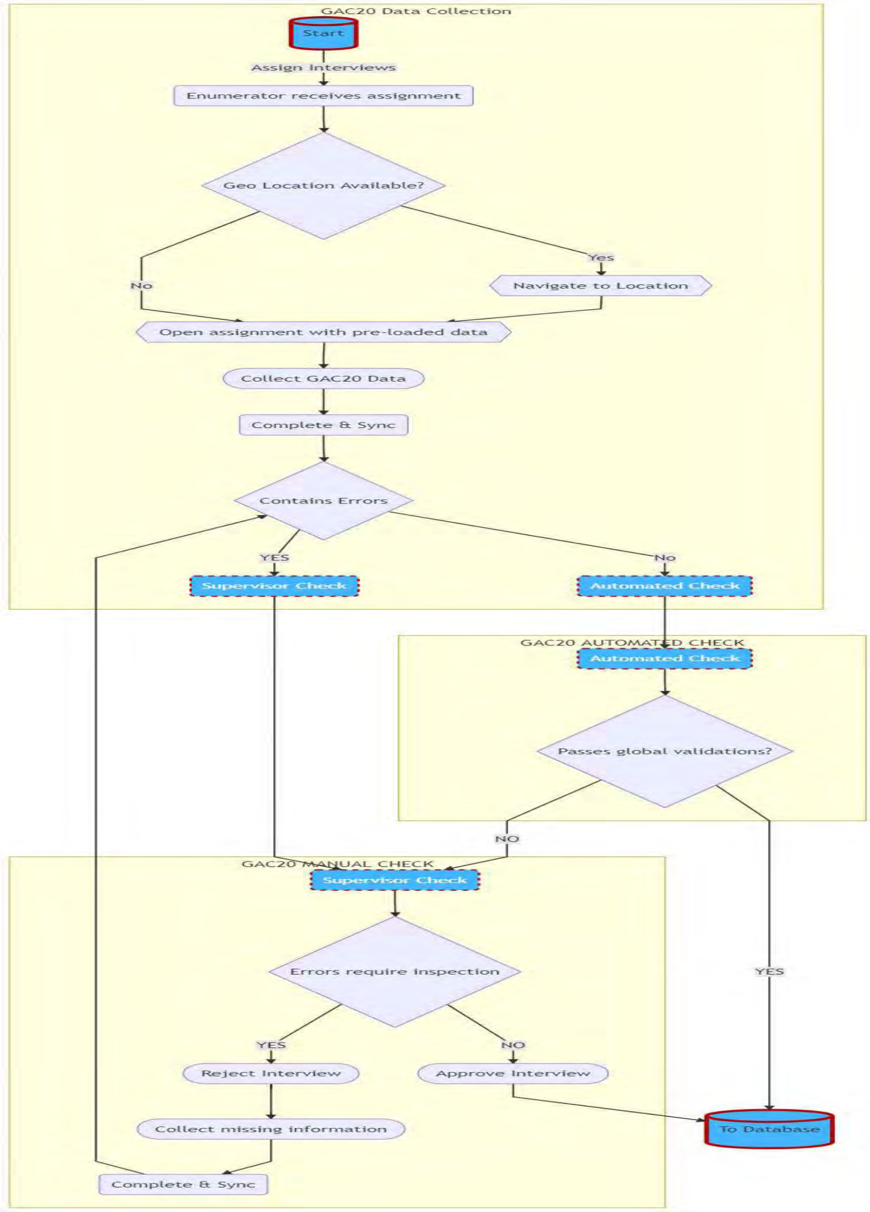
4. Recommendations for the GAC go-live production (2021)

4.1. Go-live GAC workflow

The pilot tested the CAPI data collection process and the roles attributed in Survey Solution, and exposed the limitations and shortcomings and the need for clarification and mapping with the legal framework in place (GEO22/2020) for the enumerators, chief enumerators, coordinators, staff of DTS and staff of INS (headquarter) from a management perspective, as well as the attributions for the operational process of validation and control.

As the CAPI data collection method is to be used for the actual GAC, the workflow set-up is described in Figure 5 and it provides the inputs for updating and configuring the application used for it.

Figure 5 - GAC workflow



The workflow defines the entire process with impact on the distribution of the roles and responsibilities, tasks, data checks and verification, workflow management and operations management, time and expense management and census staff training delivery.

The roles are to be enabled in the configuration of enumerator -chief enumerator (supervisor) – coordinator (observer) – headquarter, respectively as it is stated in GEO22/2020 and described as a functionality of the Survey Solution in Figure 1. This setting solves the workforce management, the operations management and the time and expense reporting. The data collection is to be performed by using tablets either by the enumerator or by the chief enumerator (supervisor) and specific training will be in place for all users.

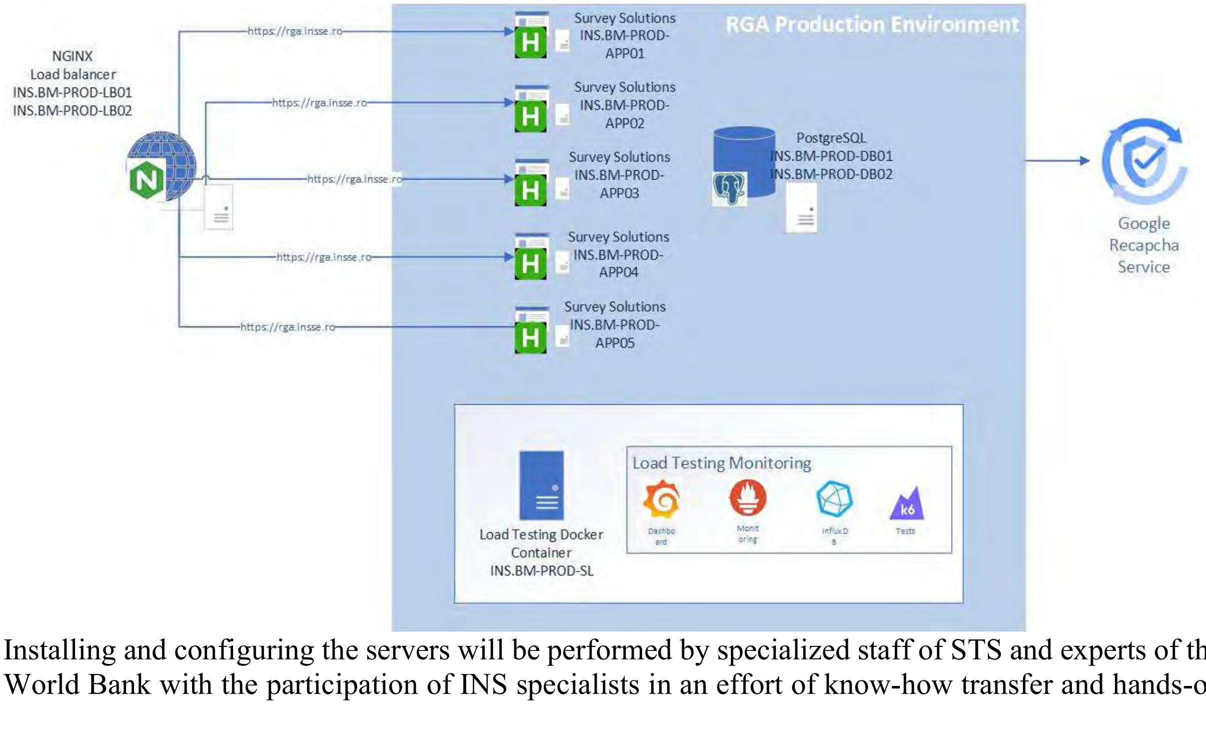
The actual census will be effective if the management and governance structure will be applied as designed in the legal framework and combined with the workflow set-up this will be applicable from the first day of GAC. Specific reports are to be developed and put in place and connected with Survey Solutions. Direct importing the reports from SuSo in a desktop-based application (Excel) for confirming the questionnaires completed and time spent by DTS will be put in place.

4.2. IT infrastructure for actual GAC

4.2.1. Hardware in place – servers and operation systems

The limitation imposed by the IT infrastructure in place for the actual census (contracting process delayed due to specific requirements for procurement process and endorsements requested at national level), has to be solved with support from STS, in the configuration designed for the GAC (data collection and data production) under Output 4.1.b[7] or at maximum available. The figure below presents recommended production environment for actual GAC.

Figure 6 - GAC Production environment



Installing and configuring the servers will be performed by specialized staff of STS and experts of the World Bank with the participation of INS specialists in an effort of know-how transfer and hands-on

[7] Output 4.1.b – includes recommendations for specifications of integrated IT system of INS for (GAC, PHC, SICCA, inter-census surveys, etc), delivered in September 2020

training and coaching. The phases for this process are designed and planned for the month before GAC stating as presented in Table 3 below.

Table 3 - Action plan for GAC infrastructure set-up

Date Start	Date End	Activity	Responsible
2021-03-10	**2021-03-26**	Checking of preloading information received from DTS (based on sectorisation results)	INS
	2021-04-12	Provide GAC infrastructure	STS
	2021-04-12	Install operating systems	STS
	2021-04-12	Allow access to World Bank to new system	STS
2021-04-12	**2021-04-14**	Install SuSo & database	World Bank
2021-04-14	**2021-04-15**	Configure SuSo & third-party services	World Bank, INS
2021-04-15	**2021-04-16**	Create HQ accounts for INS and DTS	World Bank
2021-04-16	**2021-04-20**	Import questionnaire (Desigenr - SUSO)	INS
2021-04-16	**2021-04-20**	Set up user access (supervisors, interviewers, observers)	INS
2021-04-16	**2021-04-20**	Set up GAC monitoring	World Bank
2021-04-01	**2021-04-25**	End of training for enumerators	INS
2021-04-26	**2021-04-30**	Upload assignments with preloaded information on questionnaire	INS, World Bank
2021-04-20	**2021-04-27**	Assess application security	STS
2021-04-27	**2021-04-29**	Apply recommendations	World Bank
2021-04-29	**2021-05-04**	Empty data sets and prepare for production	World Bank, INS
2021-05-01	**2021-05-10**	**Start of GAC (RGA)**	

The data production infrastructure (server) needed for the actual census must be requested to STS and rely on following minimum specifications:

- CPU 16 cores, 64 bit
- RAM 768 GB
- Data storage – 2-4 TB
- OS – UBUNTU (16.04 LTS)

The data production servers will be in place from the beginning of data collection period.

4.2.2. Tablets set-up and configuration

For preparing the actual GAC and in order to have a smooth and safe process for around 21,200 tablets configuration, several requirements and specific actions must be considered and performed. The average number of tablets to be configured per county is 500, with a maximum of 950 (one county). A correlation must exist between the period necessary for tablets configuration and the training period of the enumerators at county level. By that the following should be applied:

a) Restrictions/requirements:
  - all tablets to be configured only once, including:
    - tablet configuration (Interviewer user account on Android + restriction of using limited number of applications),
    - SuSo Interviewer app installation,
    - Interviewer app configuration: server link (https://rga.insse.ro; Interviewer username and password).

- starting tablets configuration in March 2021 considering the number of the tablets;
- possibilities for enumerators to have some testing before the real GAC.
- The configurations are to be made with final credentials.
- Instructions are to be provided to DTS for tablets configuration and indicate rga.insse.ro server.

b) Actions in preparing the tablets GAC:
   1. Upgrade the rga.insse.ro SuSo server to the latest version available 21.01.7 (build 30747) [28-30.mar.2021]
   2. Creating the credentials Interviewers, Supervisors, HQ, Observers [30-31.mar.2021]
   3. Import the latest version of the questionnaire [31.mar.2021]
   4. Creating the assignments [31.mar.2021]
   5. Tablets configuration [Territorial offices: 01-20.apr.2021]
   6. Testing the tablets and the questionnaire [Territorial offices: 01-25.apr.2021]

c) Actions required for go-live production (actual GAC):
   1. Installing the latest version 21.01.7 (build 30747) of SuSo on new infrastructure [until 20.apr.2021]
   2. Lock the updates on the server during the period May 10– July 31 2021.
   3. Creating the credentials Interviewers, Supervisors, HQ, Observers [until 25-28.apr.2021]
   4. Import the latest version of the questionnaire [until 25-28.apr.2021]
   5. Creating the assignments [until 25-28.apr.2021]
   6. Shutting down the actual infrastructure of GAC pilot [28.apr.2021]
   7. Starting the new infrastructure as the https://rga.insse.ro address [28.apr.2021]
   8. Testing the tablets on new infrastructure [28-30.apr.2021]

4.2.3. Technical and Respondents Call Centre

INS and STS will collaborate to have in place and functional the Technical Call Centre as a recommendation and a requirement of a good practice from previous censuses. Moreover, the CAPI process will generate situations when the missing coverage of mobile data could generate reasonable questions to enumerators, and they will be more conformable to appeal a call center.

The call center for respondents becomes critical in the actual GAC in the case of no public campaign in place and has to be implemented. The experience of the collaboration and support from STS, corroborated with the statements of GEO22/2020 on mandatory actions, including the call center, could ensure its functioning. It is recommended to prepare in advance the call center operators and inform them about the main topics of census, being able this way to get familiarized with the operations and anticipate questions and needed answers from respondents. This component of the call center is a separate one from the technical call center (dedicated to enumerators), but as physical equipment is a sole one including the two functions.

4.3. Training

The training of the enumerators, supervisors and observers is critical for performing the actual GAC. By that, the training plan proposed under Output 2a. is recommended to be applied and structured on the specifics of the territory (number of census staff, availability of premises, pandemic situation and restrictions applicable at local level). Hands-on training (using the tables in direct training) will ensure the learning of the application features and use. The following recommendations should be applied:

- At training, the tablets configured with the final credentials and with a link to the rga.insse.ro server are handed over to enumerators.

- The trainings must be done in groups of max 25 participants, according to the legislation in force (reason for a min 3 weeks necessary to train all staff).
- Tablets are handed over during training in order to avoid repeated travel within the county (for health security reasons). In the period between the training date and April 29, the enumerator can practice on tablet and questionnaire.
- Between April 30 - May 9, the access the rga.insse.ro server is to be forbidden/restricted.
- Training is to be done on the rga.insse.ro server (according to instructions already provided for configuration and trainings).

A proposed action plan is presented in Table 4 below.

Table 4 - Acton plan for training of census staff

Date Start	Date End	Activity	Responsible
2021-03-15	2021-03-25	Creation and upload of final credentials for enumerators, supervisors and observers on the rga.insse.ro server	INS
2021-04-01	2021-04-24	Association credential with census sections and sectors (preloading information); additional verifications	INS
2021-03-15	2021-03-25	Training of trainers (200 persons from DTS)	INS, WORLD BANK
2021-03-23	2021-04-23	Configuration of tablets for enumerators on the rga.insse ro server	DTS
2021-04-01	2021-04-29	Training of enumerators, using configured tablets, with final credential, on the rga.insse.ro server	DTS
2021-04-30	2021-05-09	Upload questionnaires with preloaded information and assignments	

In considering the training delivery, the localized tutorials have to be in place, as desirable as possible, or at least translations of the actual Survey Solution tutorials.

4.4. Promotion and communication campaign

As mentioned in Output 2a, the census promotion campaign is an essential element of the GAC in the new method of data collection – CAPI and can be considered not optional. Despite these, some limitations determined by budget constrains are expected to affect the promotion campaign. The promotion campaign can play a critical role in enhancing data quality through increased respondent participation. By that the advertising/announcement campaign should use the proper information means and channels to reach the target audience - population consists of all the agricultural holdings in the country.

5. Annexes

Annex 1 – GAC Solution detailed configuration

The most accurate description of the configuration of all system(s) components is to provide the installation logs, which are presented below.

1. Load Balancer installation log

Steps performed in configuring load balancing server:

1. Enable name resolution – edit /etc/resolv.conf with Google public DNS services:

```
nameserver 8.8.8.8

nameserver 8.8.8.4
```

2. Install yum-utils, gcc:

```
# yum -y install epel-release yum-utils gcc
```

3. Download nginx-1.18 stable release, openssl-1.1.1c and nginx-sticky-module-ng into /home/admin:

```
$ wget https://nginx.org/download/nginx-1.18.0.tar.gz

$ wget https://www.openssl.org/source/openssl-1.1.1c.tar.gz

$ wget https://bitbucket.org/nginx-goodies/nginx-sticky-module-ng/get/08a395c66e42.zip
```

4. Decompress the archives and change current user to root:

```
$ gunzip nginx-1.18.0.tar.gz

$ tar -xvf nginx-1.18.0.tar

$ gunzip 08a395c66e42.zip

$ cd nginx-1.18.0

$ su
```

5. Install nginx from source:

```
# yum install nginx

# ./configure --sbin-path=/usr/local/nginx/nginx --conf-path=/usr/local/nginx/nginx.conf --pid-
path=/usr/local/nginx/nginx.pid --with-http_ssl_module --add-module=/home/admin/nginx-goodies-nginx-sticky-module-
ng-08a395c66e42 --with-http_gunzip_module --with-http_gzip_static_module --with-http_stub_stUATs_module --with-
openssl=/home/admin/openssl-1.1.1c

# make

# make install
```

6. Configure nginx as a service. Edit /etc/systemd/system/nginx-1.18.0.service:

```
[Unit]

Description=nginx 1.18.0

After=syslog.target network.target



[Service]

Type=forking

EnvironmentFile=/etc/sysconfig/nginx-1.16.0

ExecStart=/usr/local/nginx/nginx $CLI_OPTIONS
```

```
ExecReload=/usr/local/nginx/nginx -s reload

ExecStop=/usr/local/nginx/nginx -s quit


[Install]

WantedBy=multi-user.target
```

7. Reload daemons:

```
# systemctl daemon-reload
```

8. Edit /etc/sysconfig/nginx-1.18.0

```
# Command line options to use when starting nginx

#CLI_OPTIONS=""
```

9. Edit NGINX configuration file (/usr/local/nginx/nginx.conf) as follows:

```
user  nginx;

worker_processes  1;


error_log  /var/log/nginx/error.log warn;

pid        /var/run/nginx.pid;




events {

    worker_connections  1024;

}




http {

    include /usr/local/nginx/mime.types;

    default_type  application/octet-stream;


    log_format  main  '$remote_addr - $remote_user [$time_local] "$request" '

                      '$stUATs $body_bytes_sent "$http_referer" '

                      '"$http_user_agent" "$http_x_forwarded_for"';


    access_log  /var/log/nginx/access.log  main;


    sendfile        on;

    #tcp_nopush     on;
    keepalive_timeout  65;


    gzip  on;


    include /etc/nginx/conf.d/*.conf;
    map $http_upgrade $connection_upgrade {
        default Upgrade;
        "      close;
    }
}
```

10. Edit /etc/nginx/conf.d/rga.conf:

```
server {
    server_name  rga.insse.ro;


    #charset koi8-r;
    access_log  /var/log/nginx/rga.access.log  main;


    location / {
           proxy_pass http://xxx xxx.xx xx xxxx;
            proxy_read_timeout 90;
            proxy_http_version 1.1;
            proxy_set_header   Upgrade $http_upgrade;
            proxy_set_header   Connection $connection_upgrade;
            proxy_set_header   Host $host;
            proxy_cache_bypass $http_upgrade;
            proxy_set_header   X-Forwarded-For $proxy_add_x_forwarded_for;
            proxy_set_header   X-Forwarded-Proto $scheme;
    }


    location /metrics {
            deny all;
    }
    listen 443 ssl; # managed by Certbot
    ssl_certificate /etc/letsencrypt/live/rga.insse ro/fullchain.pem; # managed by Certbot
    ssl_certificate_key /etc/letsencrypt/live/rga.insse ro/privkey.pem; # managed by Certbot
    include /etc/letsencrypt/options-ssl-nginx.conf; # managed by Certbot
    ssl_dhparam /etc/letsencrypt/ssl-dhparams.pem; # managed by Certbot


}


server {
    if ($host = rga.insse ro) {
        return 301 https://$host$request_uri;
    } # managed by Certbot



    server_name  rga.insse.ro;
    listen 80;
    return 404; # managed by Certbot



}
```

11. Edit /etc/nginx/conf.d/stub_stUATs.conf

```
server {
    server_name  stub;


    #charset koi8-r;
    access_log  /var/log/nginx/stub.access.log  main;


    listen 8080;


    location / {
        stub_stUATs;
        allow xxx xxx.xx xx; #only allow requests from monitoring server
        deny all;           #deny all other hosts
    }

}
```

12. Start Enable nginx when system boots:

```
# systemctl start nginx-1.18.0

# systemctl enable nginx-1.18.0
```

13. Install CertBot Let’s Encrypt client:

```
# yum install certbot-nginx
```

14. Install Let’s encrypt SSL certificates:

```
# certbot --nginx --nginx-server-root /usr/local/nginx --nginx-ctl /usr/local/nginx/nginx -d recensaminte.insse ro

# certbot --nginx --nginx-server-root /usr/local/nginx --nginx-ctl /usr/local/nginx/nginx -d rpl.insse ro

# certbot --nginx --nginx-server-root /usr/local/nginx --nginx-ctl /usr/local/nginx/nginx -d rga.insse.ro
```

15. Set up SSL certificate auto-renewal by editing crontab

```
#crontab -e

15 3 * * * /usr/bin/certbot renew --quiet
```

16. Add node_exporter repository

```
# curl -Lo /etc/yum repos.d/_copr_ibotty-prometheus-exporters repo
https://copr fedorainfracloud.org/coprs/ibotty/prometheus-exporters/repo/epel-7/ibotty-prometheus-exporters-epel-7.repo
```

17. Install node_exporter

```
# yum install node_exporter
```

18. Start and enable node_exporter as a service

```
# systemctl start node_exporter

# systemctl enable node_exporter
```

19. Start and enable firewall:

```
# systemctl start firewalld

# systemctl enable firewalld
```

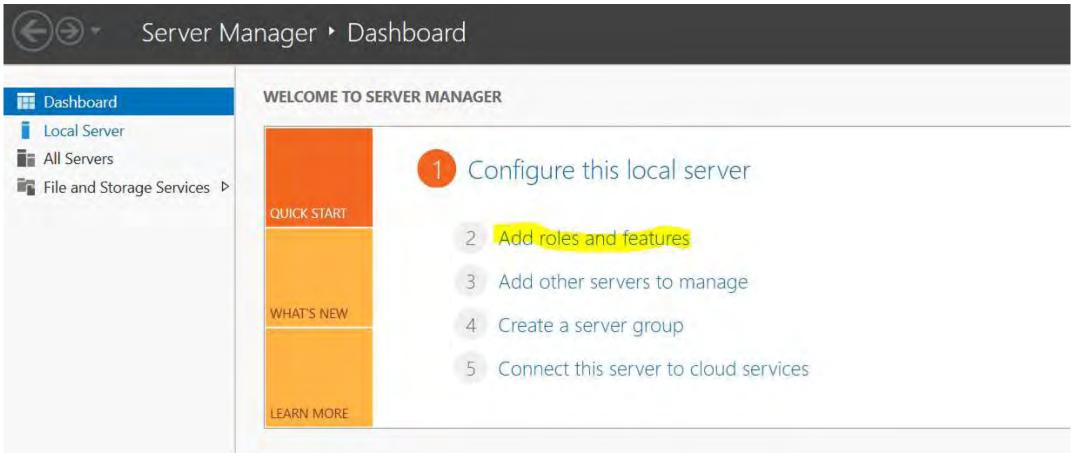
20. Enable firewall rules:

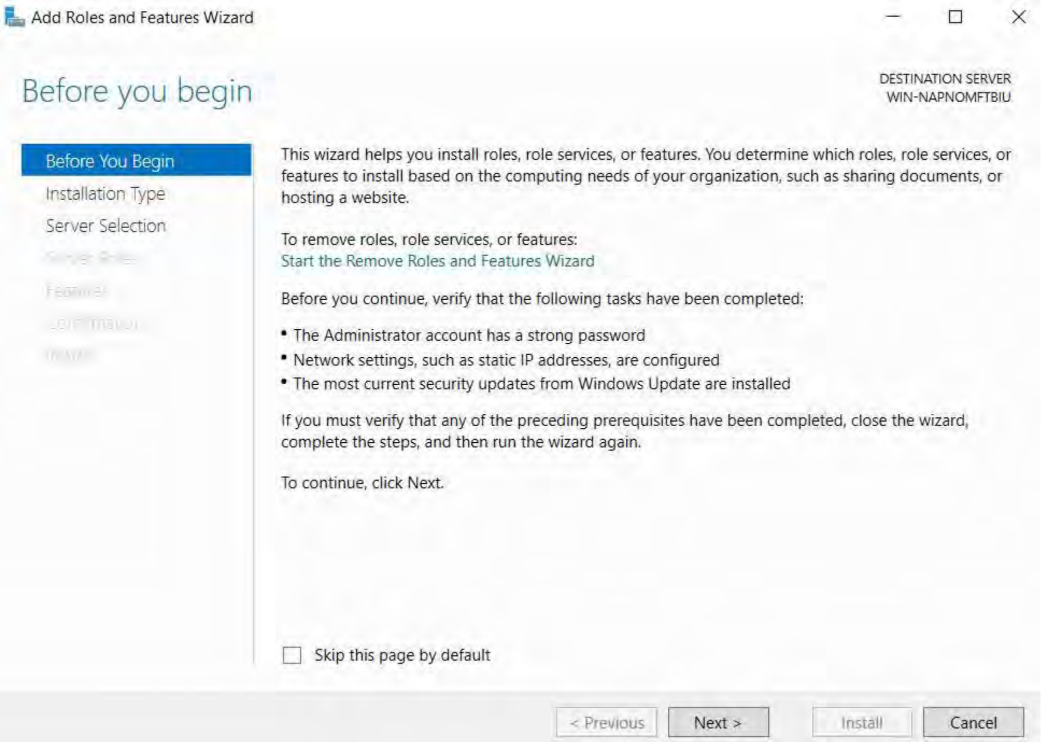
```
# firewall-cmd --permanent --zone=public --add-service=http

# firewall-cmd --permanent --zone=public --add-service=https

# firewall-cmd --permanent --zone=public --add-port=8080/tcp

# firewall-cmd --permanent --zone=public --add-port=9100/tcp

# firewall-cmd
```

2. GAC pilot installation log

Steps performed in configuring application server nodes:

1. Add Web Server role and telnet client feature to the node:


Server Manager ‣ Dashboard
Dashboard
Local Server
All Servers
File and Storage Services
WELCOME TO SERVER MANAGER
QUICK START
WHAT'S NEW
LEARN MORE
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
5 Connect this server to cloud services



This wizard helps you install roles, role services, or features. You determine which roles, role services, or features to install based on the computing needs of your organization, such as sharing documents, or hosting a website.

To remove roles, role services, or features:
Start the Remove Roles and Features Wizard

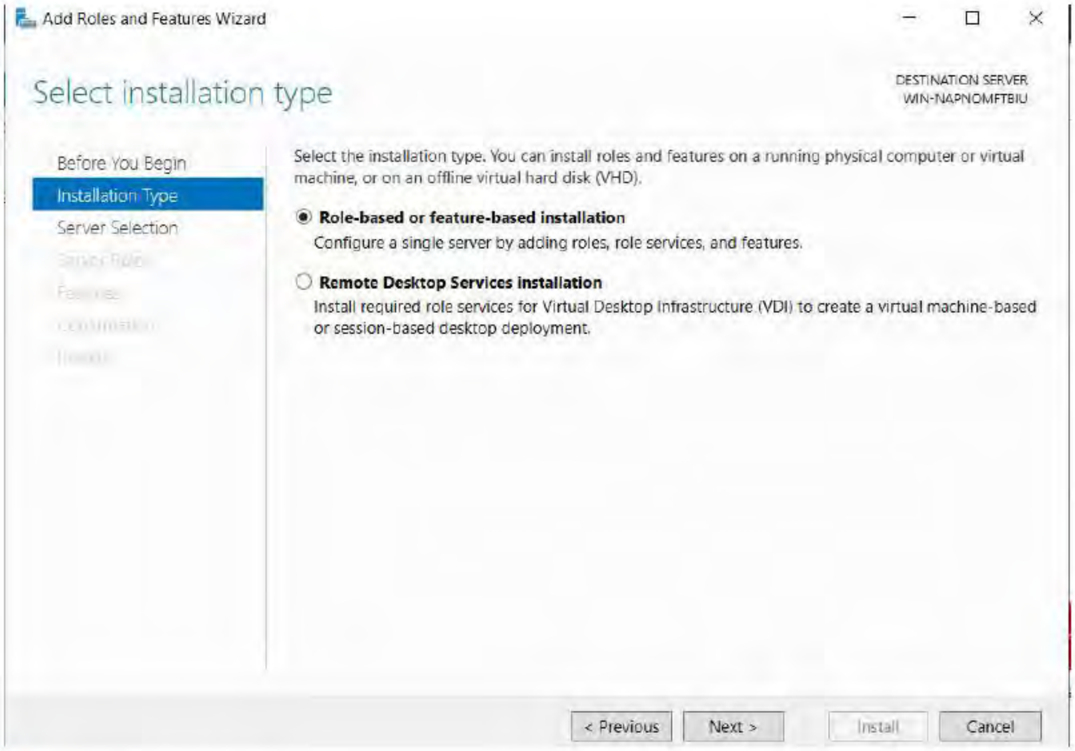
Before you continue, verify that the following tasks have been completed:

- The Administrator account has a strong password
- Network settings, such as static IP addresses, are configured
- The most current security updates from Windows Update are installed

If you must verify that any of the preceding prerequisites have been completed, close the wizard, complete the steps, and then run the wizard again.

To continue, click Next.

☐ Skip this page by default



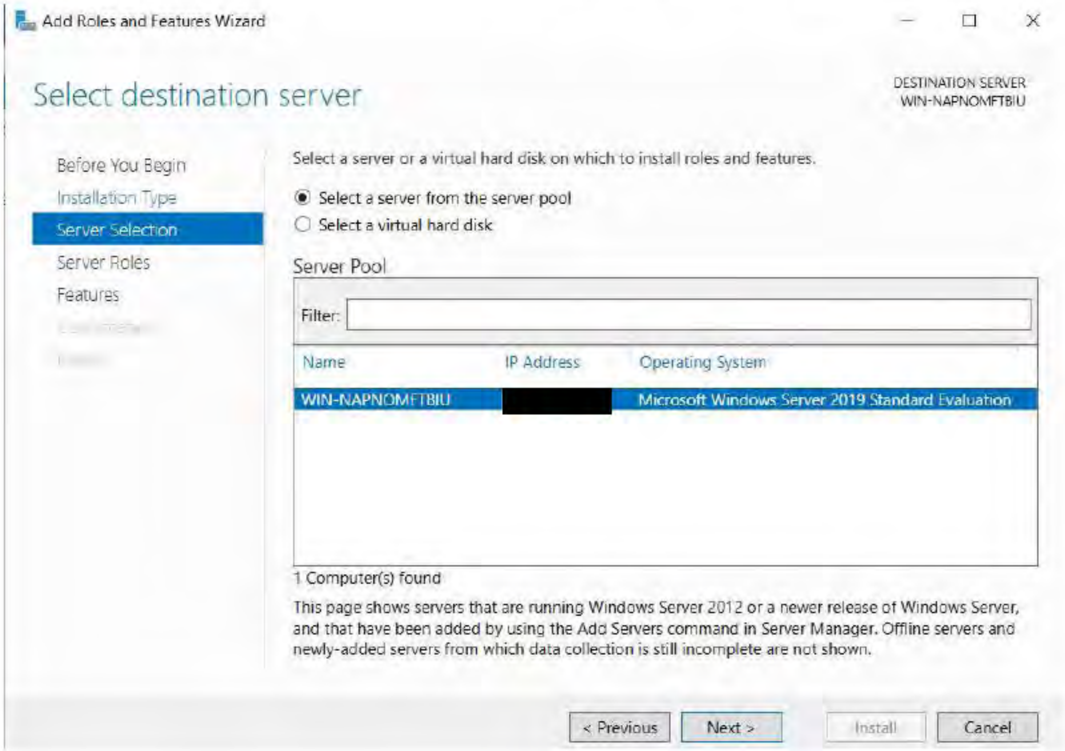
Select installation type

DESTINATION SERVER
WIN-NAPNOMFTBIU

Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual hard disk (VHD).

● **Role-based or feature-based installation**
Configure a single server by adding roles, role services, and features.

○ **Remote Desktop Services installation**
Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based or session-based desktop deployment.



Select destination server

DESTINATION SERVER
WIN-NAPNOMFTBIU

Select a server or a virtual hard disk on which to install roles and features.

● Select a server from the server pool
○ Select a virtual hard disk

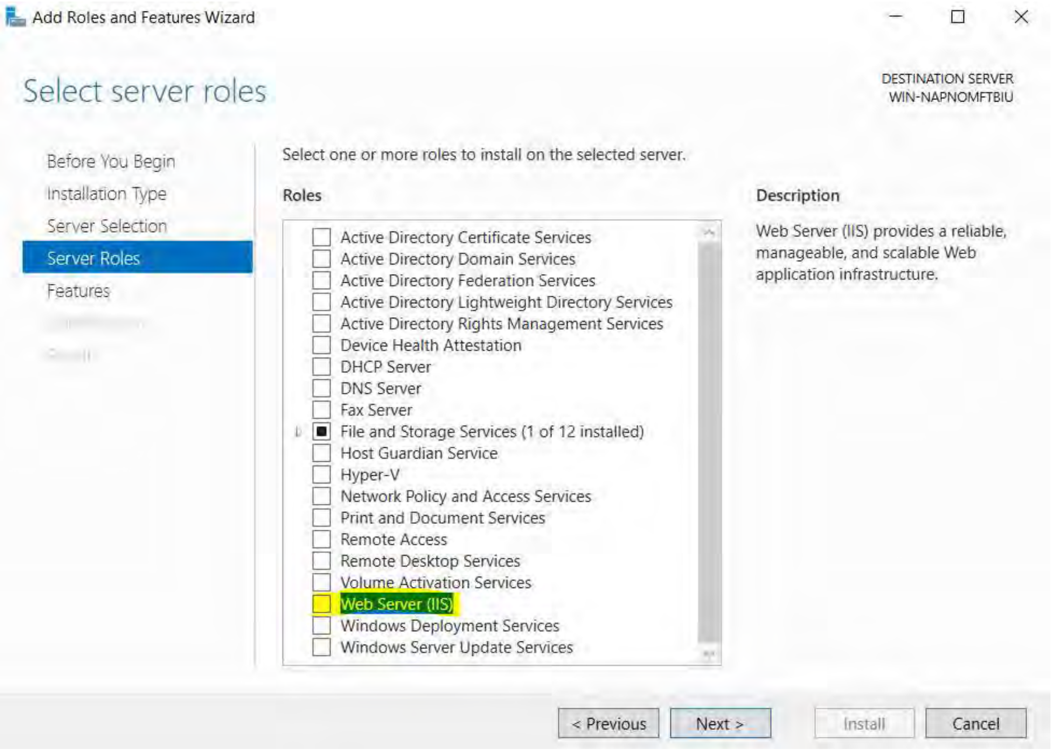
Server Pool

Filter:

Name	IP Address	Operating System
WIN-NAPNOMFTBIU	[redacted]	Microsoft Windows Server 2019 Standard Evaluation

1 Computer(s) found

This page shows servers that are running Windows Server 2012 or a newer release of Windows Server, and that have been added by using the Add Servers command in Server Manager. Offline servers and newly-added servers from which data collection is still incomplete are not shown.



Add Roles and Features Wizard

Select server roles

DESTINATION SERVER
WIN-NAPNOMFTBIU

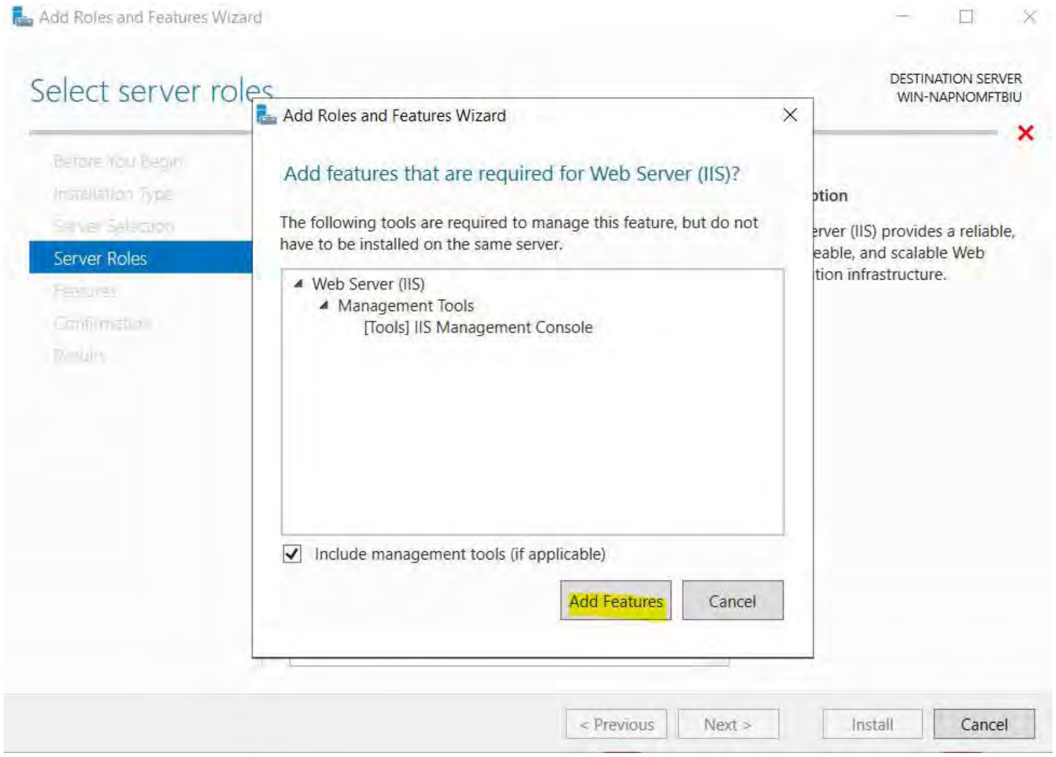
Select one or more roles to install on the selected server.

Roles

- □ Active Directory Certificate Services
- □ Active Directory Domain Services
- □ Active Directory Federation Services
- □ Active Directory Lightweight Directory Services
- □ Active Directory Rights Management Services
- □ Device Health Attestation
- □ DHCP Server
- □ DNS Server
- □ Fax Server
- ■ File and Storage Services (1 of 12 installed)
- □ Host Guardian Service
- □ Hyper-V
- □ Network Policy and Access Services
- □ Print and Document Services
- □ Remote Access
- □ Remote Desktop Services
- □ Volume Activation Services
- □ Web Server (IIS)
- □ Windows Deployment Services
- □ Windows Server Update Services

Description

Web Server (IIS) provides a reliable, manageable, and scalable Web application infrastructure.



Add Roles and Features Wizard

Select server roles

DESTINATION SERVER
WIN-NAPNOMFTBIU

Add Roles and Features Wizard

Add features that are required for Web Server (IIS)?

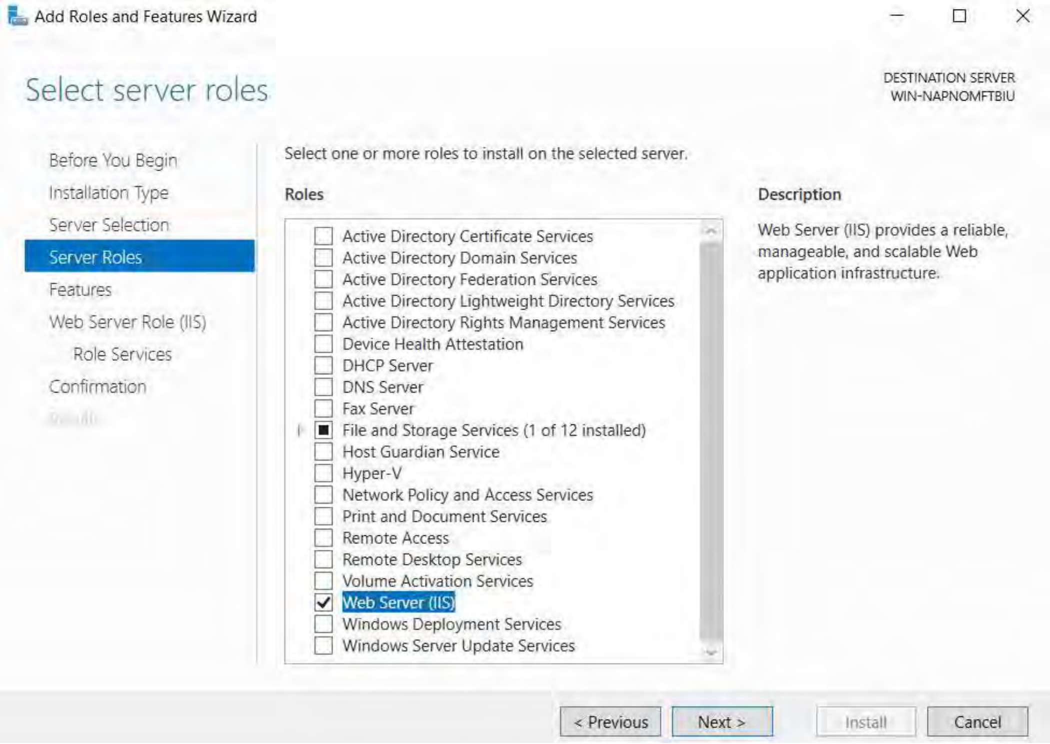
The following tools are required to manage this feature, but do not have to be installed on the same server.

- Web Server (IIS)
  - Management Tools
    - [Tools] IIS Management Console

☑ Include management tools (if applicable)

ption

erver (IIS) provides a reliable, eable, and scalable Web tion infrastructure.



Add Roles and Features Wizard

Select server roles

DESTINATION SERVER
WIN-NAPNOMFTBIU

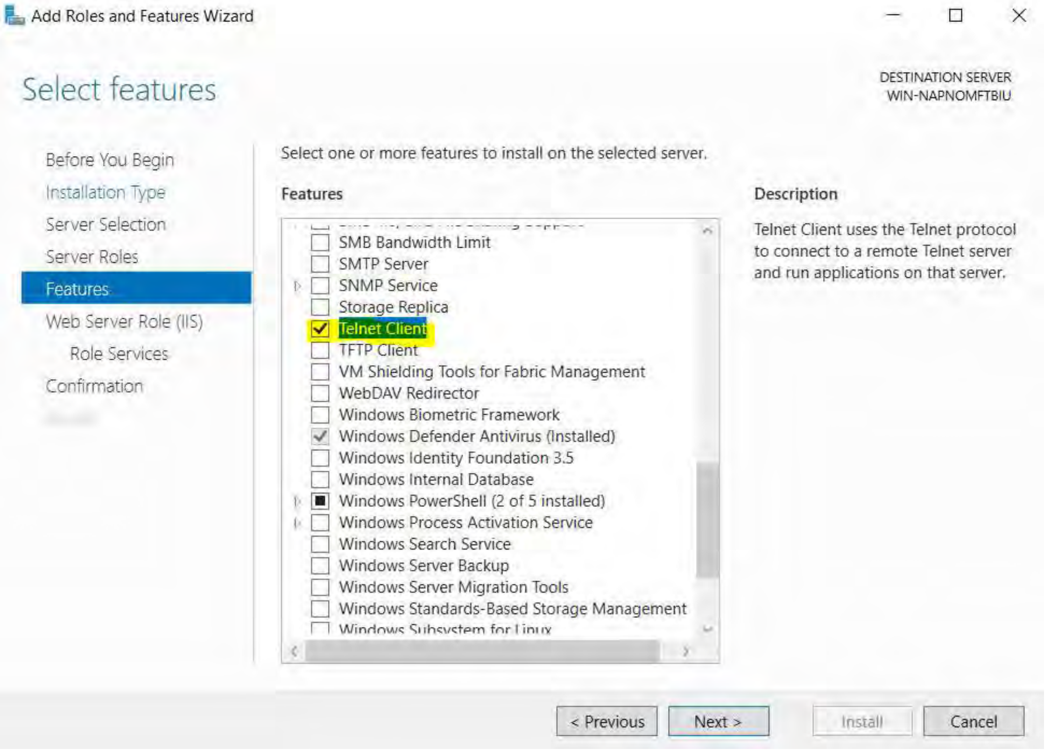
Select one or more roles to install on the selected server.

Roles

- ☐ Active Directory Certificate Services
- ☐ Active Directory Domain Services
- ☐ Active Directory Federation Services
- ☐ Active Directory Lightweight Directory Services
- ☐ Active Directory Rights Management Services
- ☐ Device Health Attestation
- ☐ DHCP Server
- ☐ DNS Server
- ☐ Fax Server
- ■ File and Storage Services (1 of 12 installed)
- ☐ Host Guardian Service
- ☐ Hyper-V
- ☐ Network Policy and Access Services
- ☐ Print and Document Services
- ☐ Remote Access
- ☐ Remote Desktop Services
- ☐ Volume Activation Services
- ☑ Web Server (IIS)
- ☐ Windows Deployment Services
- ☐ Windows Server Update Services

Description

Web Server (IIS) provides a reliable, manageable, and scalable Web application infrastructure.



Add Roles and Features Wizard

Select features

DESTINATION SERVER
WIN-NAPNOMFTBIU

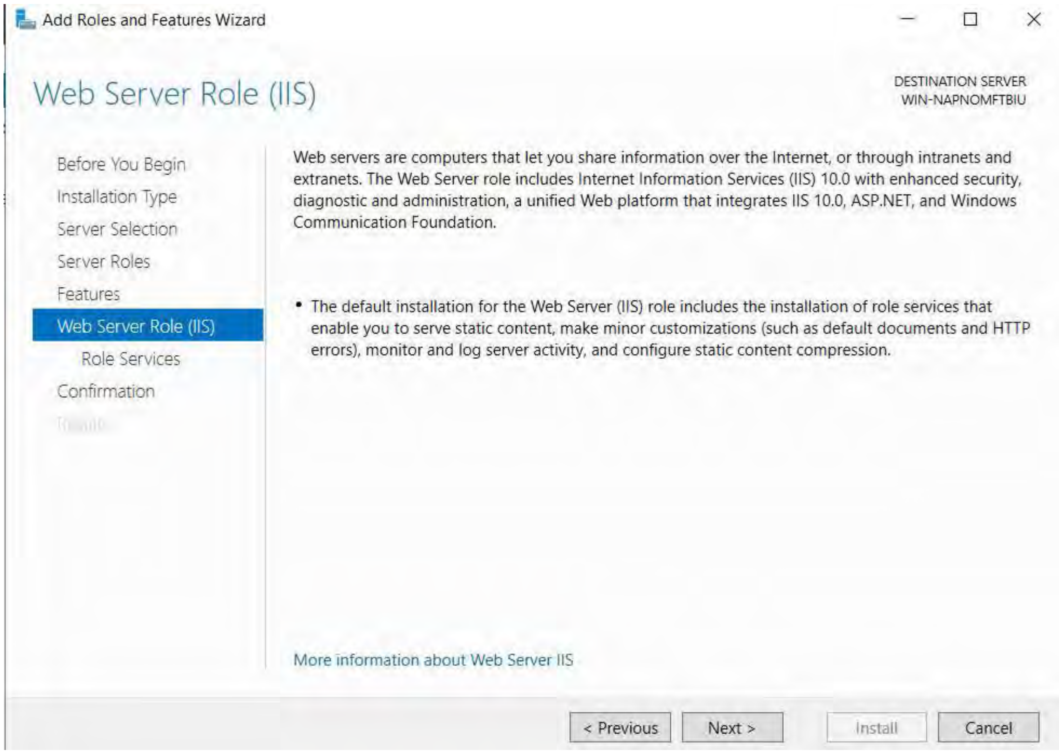
Select one or more features to install on the selected server.

Features

- ☐ SMB Bandwidth Limit
- ☐ SMTP Server
- ☐ SNMP Service
- ☐ Storage Replica
- ☑ Telnet Client
- ☐ TFTP Client
- ☐ VM Shielding Tools for Fabric Management
- ☐ WebDAV Redirector
- ☐ Windows Biometric Framework
- ☑ Windows Defender Antivirus (Installed)
- ☐ Windows Identity Foundation 3.5
- ☐ Windows Internal Database
- ■ Windows PowerShell (2 of 5 installed)
- ☐ Windows Process Activation Service
- ☐ Windows Search Service
- ☐ Windows Server Backup
- ☐ Windows Server Migration Tools
- ☐ Windows Standards-Based Storage Management
- ☐ Windows Subsystem for Linux

Description

Telnet Client uses the Telnet protocol to connect to a remote Telnet server and run applications on that server.



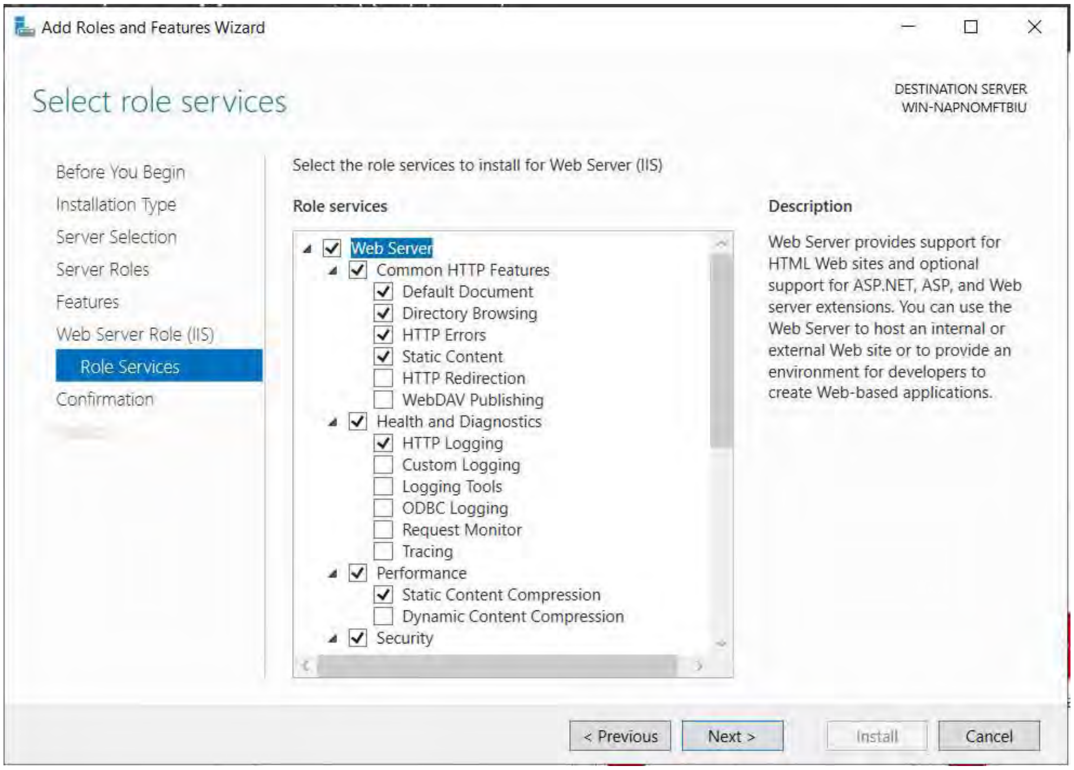
Web Server Role (IIS)

DESTINATION SERVER
WIN-NAPNOMFTBIU

Web servers are computers that let you share information over the Internet, or through intranets and extranets. The Web Server role includes Internet Information Services (IIS) 10.0 with enhanced security, diagnostic and administration, a unified Web platform that integrates IIS 10.0, ASP.NET, and Windows Communication Foundation.

- The default installation for the Web Server (IIS) role includes the installation of role services that enable you to serve static content, make minor customizations (such as default documents and HTTP errors), monitor and log server activity, and configure static content compression.

More information about Web Server IIS



Select role services

DESTINATION SERVER
WIN-NAPNOMFTBIU

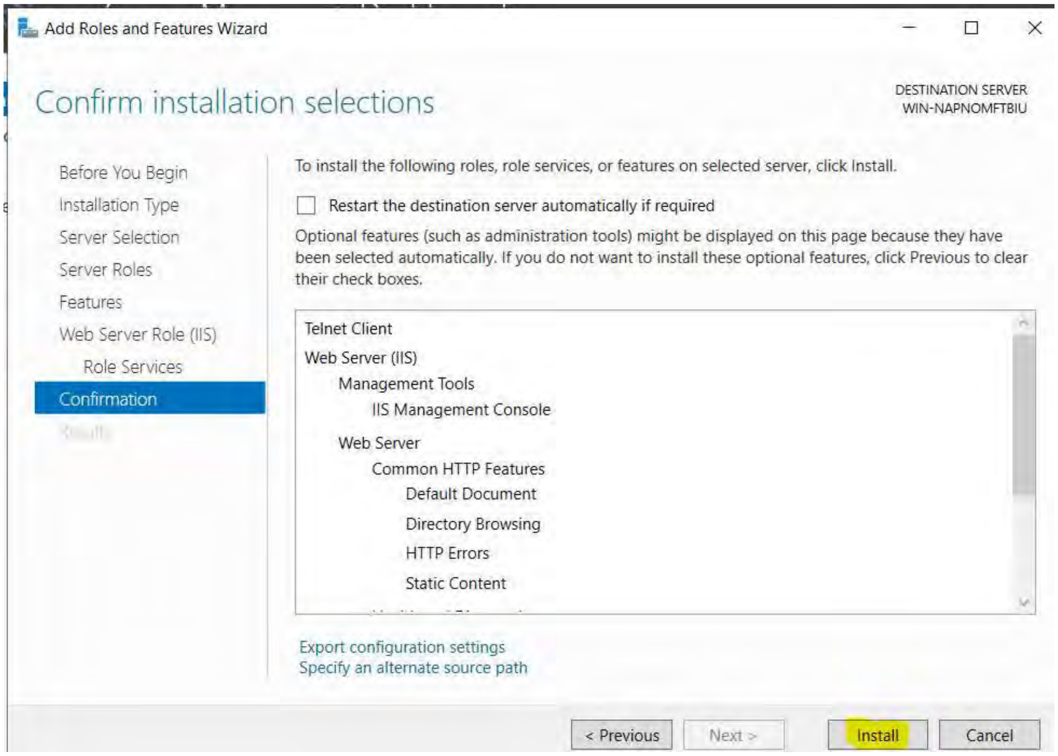
Select the role services to install for Web Server (IIS)

Role services

- ☑ Web Server
  - ☑ Common HTTP Features
    - ☑ Default Document
    - ☑ Directory Browsing
    - ☑ HTTP Errors
    - ☑ Static Content
    - ☐ HTTP Redirection
    - ☐ WebDAV Publishing
  - ☑ Health and Diagnostics
    - ☑ HTTP Logging
    - ☐ Custom Logging
    - ☐ Logging Tools
    - ☐ ODBC Logging
    - ☐ Request Monitor
    - ☐ Tracing
  - ☑ Performance
    - ☑ Static Content Compression
    - ☐ Dynamic Content Compression
  - ☑ Security

Description

Web Server provides support for HTML Web sites and optional support for ASP.NET, ASP, and Web server extensions. You can use the Web Server to host an internal or external Web site or to provide an environment for developers to create Web-based applications.



Confirm installation selections

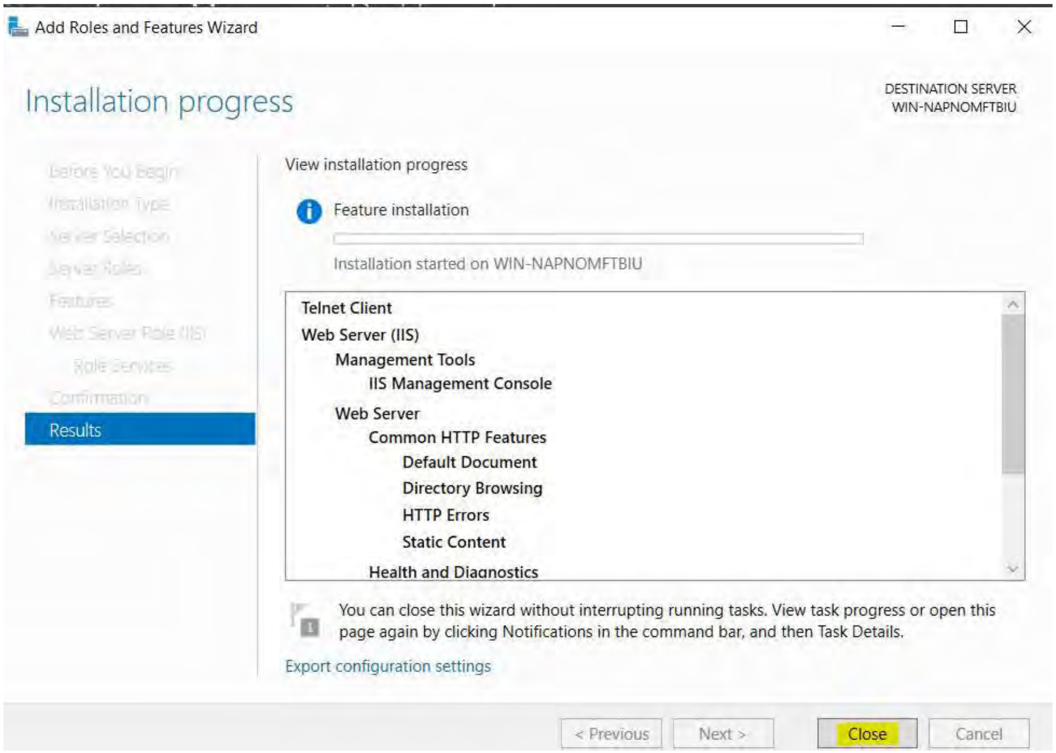
DESTINATION SERVER
WIN-NAPNOMFTBIU

To install the following roles, role services, or features on selected server, click Install.

□ Restart the destination server automatically if required

Optional features (such as administration tools) might be displayed on this page because they have been selected automatically. If you do not want to install these optional features, click Previous to clear their check boxes.

Telnet Client
Web Server (IIS)
    Management Tools
        IIS Management Console
    Web Server
        Common HTTP Features
            Default Document
            Directory Browsing
            HTTP Errors
            Static Content



Installation progress

DESTINATION SERVER
WIN-NAPNOMFTBIU

View installation progress

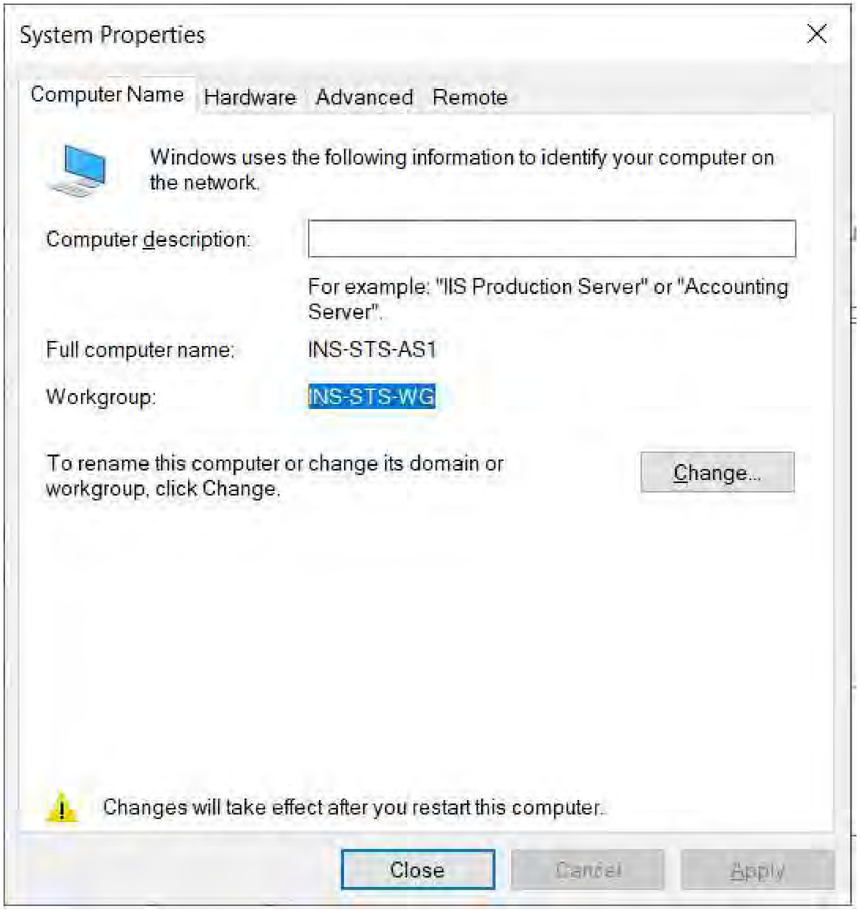
Feature installation

Installation started on WIN-NAPNOMFTBIU

Telnet Client
Web Server (IIS)
    Management Tools
        IIS Management Console
    Web Server
        Common HTTP Features
            Default Document
            Directory Browsing
            HTTP Errors
            Static Content
        Health and Diagnostics

You can close this wizard without interrupting running tasks. View task progress or open this page again by clicking Notifications in the command bar, and then Task Details.

2. Change the name of the node to INS-STS-GAC and workgroup to INS-STS-WG and restart the nodes:



System Properties

Windows uses the following information to identify your computer on the network.

Computer description:

For example: "IIS Production Server" or "Accounting Server".

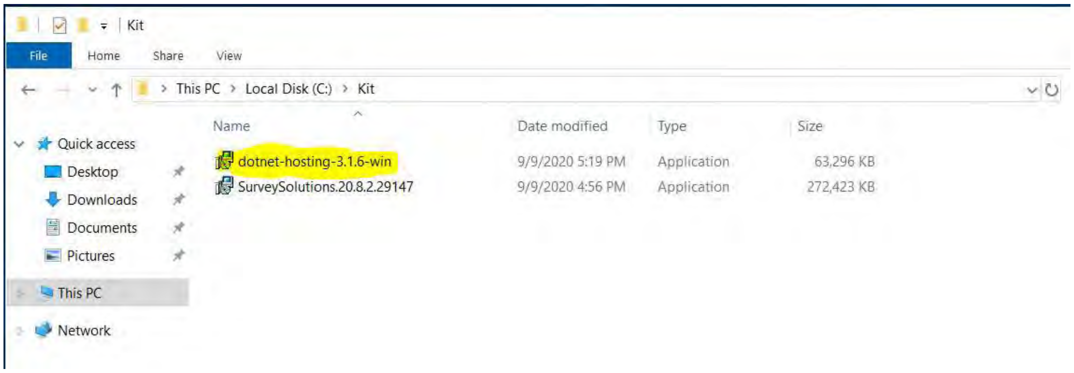
Full computer name: INS-STS-AS1

Workgroup: INS-STS-WG

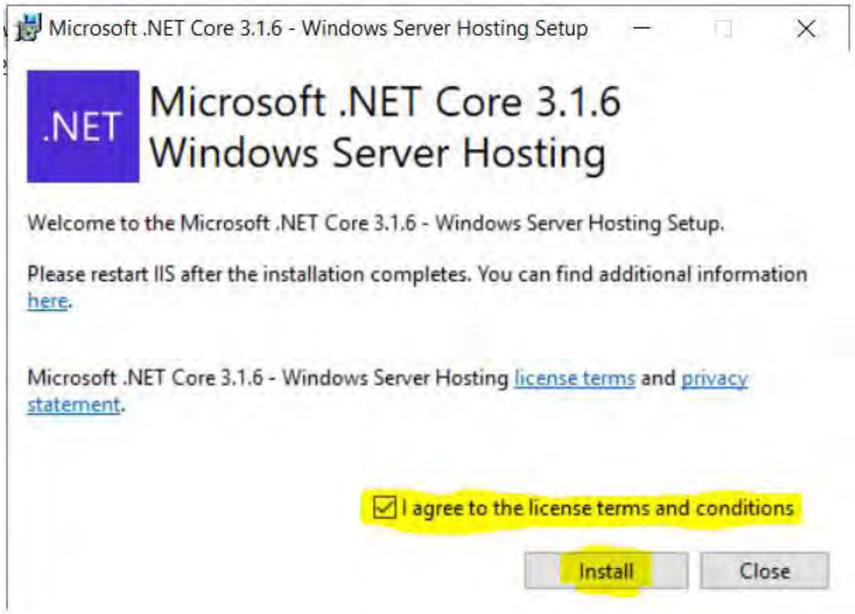
To rename this computer or change its domain or workgroup, click Change.

Changes will take effect after you restart this computer.

3. Install Microsoft .NET Core Runtime 3.1.6:



Name	Date modified	Type	Size
dotnet-hosting-3.1.6-win	9/9/2020 5:19 PM	Application	63,296 KB
SurveySolutions.20.8.2.29147	9/9/2020 4:56 PM	Application	272,423 KB



Microsoft .NET Core 3.1.6 - Windows Server Hosting Setup

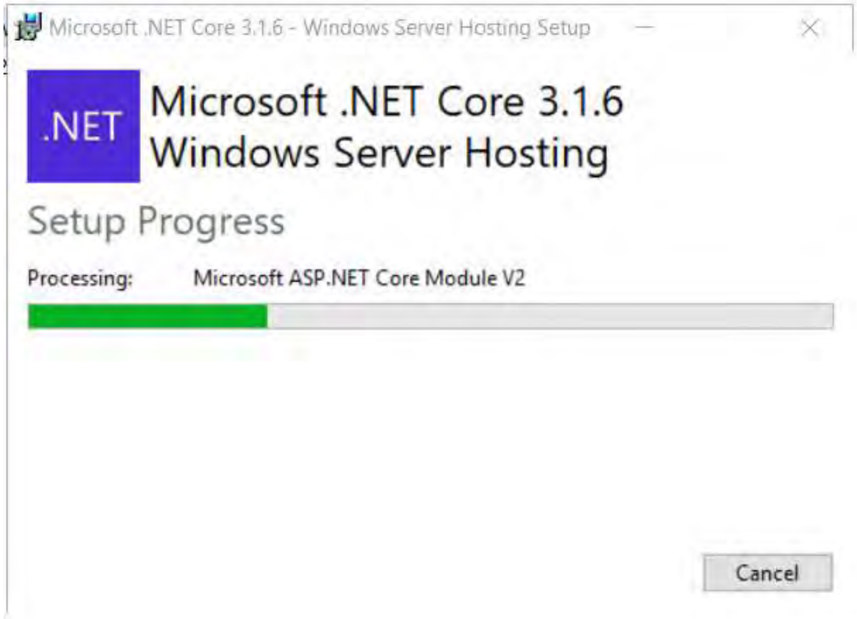
Microsoft .NET Core 3.1.6
Windows Server Hosting

Welcome to the Microsoft .NET Core 3.1.6 - Windows Server Hosting Setup.

Please restart IIS after the installation completes. You can find additional information here.

Microsoft .NET Core 3.1.6 - Windows Server Hosting license terms and privacy statement.

☑ I agree to the license terms and conditions

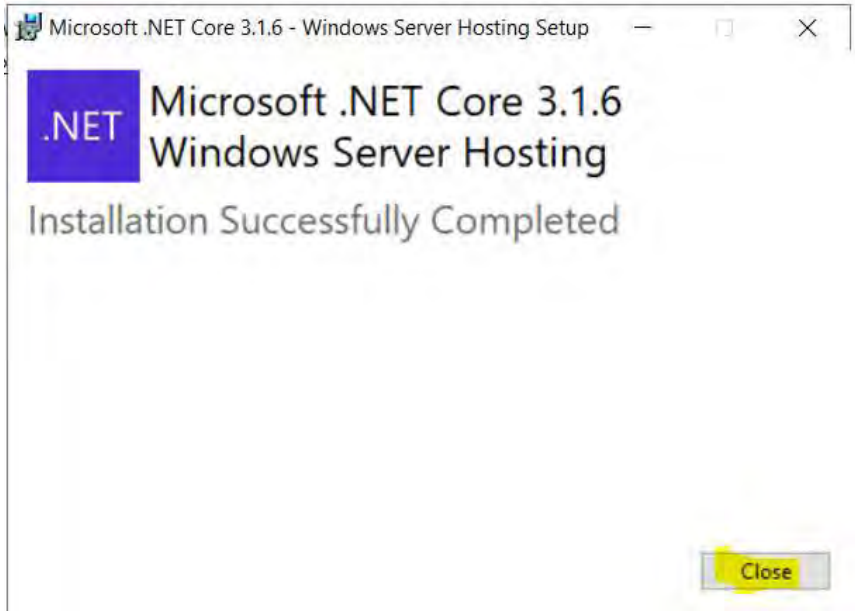


Microsoft .NET Core 3.1.6 - Windows Server Hosting Setup

Microsoft .NET Core 3.1.6
Windows Server Hosting

Setup Progress

Processing: Microsoft ASP.NET Core Module V2

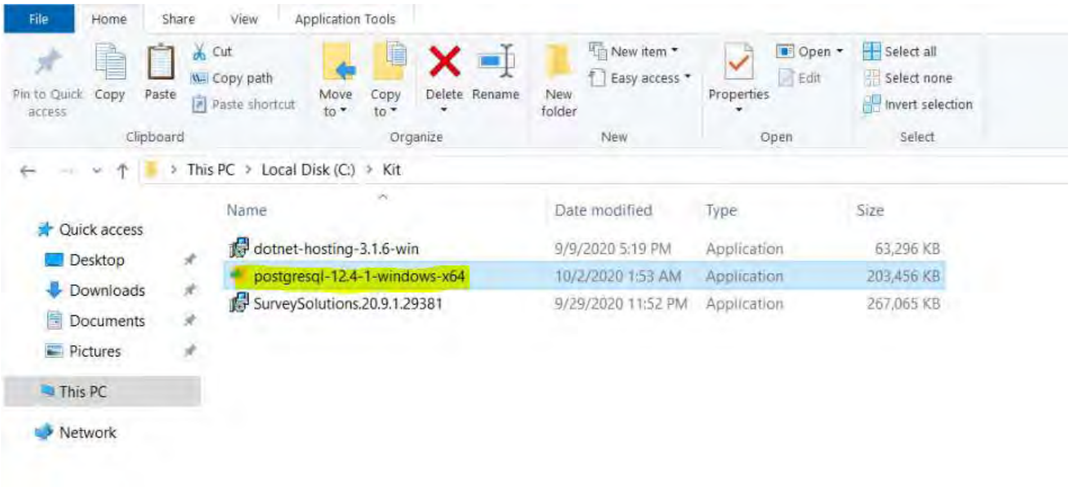


Microsoft .NET Core 3.1.6 - Windows Server Hosting Setup

Microsoft .NET Core 3.1.6 Windows Server Hosting

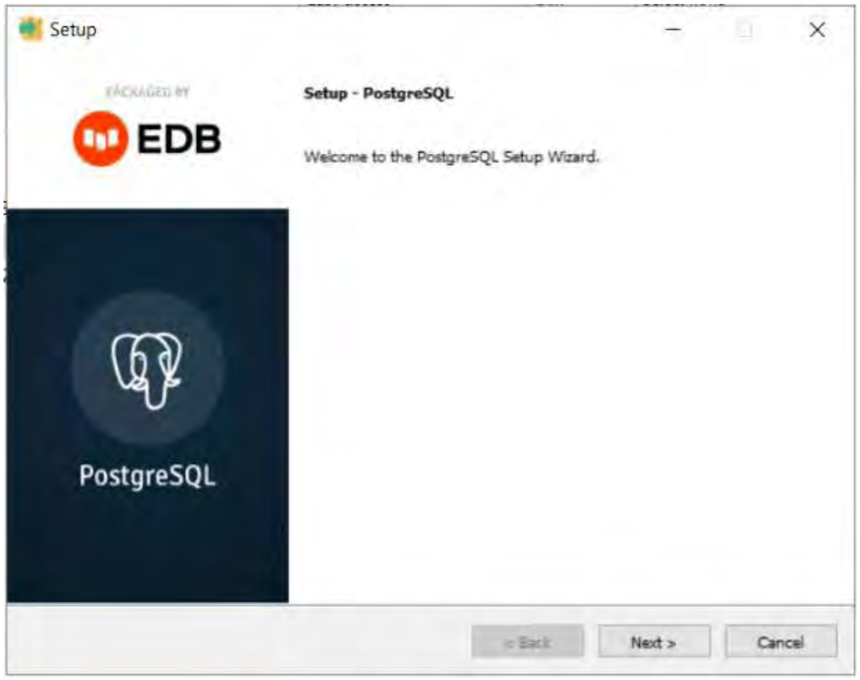
Installation Successfully Completed

4. Install PostgreSQL 12.4.1:



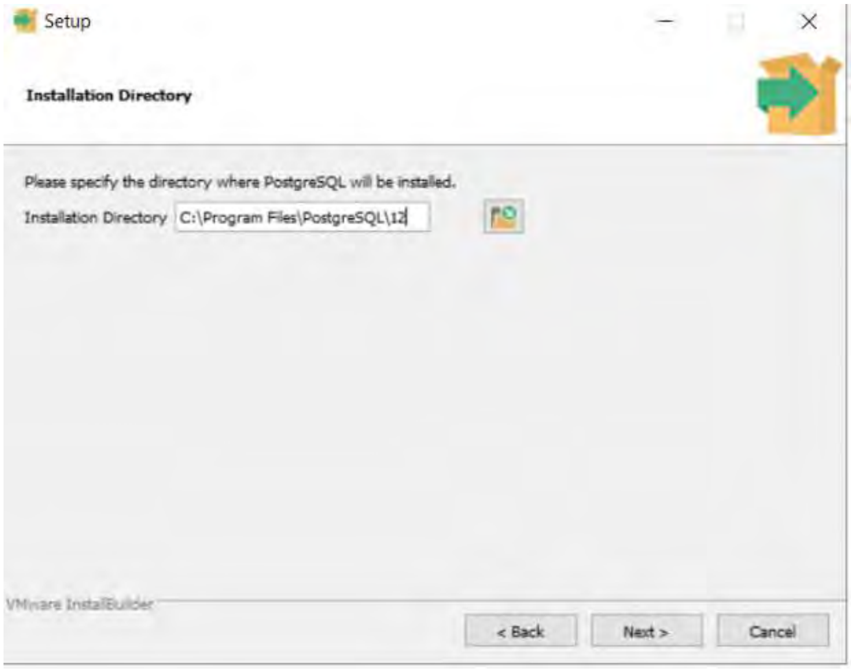
This PC > Local Disk (C:) > Kit

Name	Date modified	Type	Size
dotnet-hosting-3.1.6-win	9/9/2020 5:19 PM	Application	63,296 KB
postgresql-12.4-1-windows-x64	10/2/2020 1:53 AM	Application	203,456 KB
SurveySolutions.20.9.1.29381	9/29/2020 11:52 PM	Application	267,065 KB



Setup - PostgreSQL

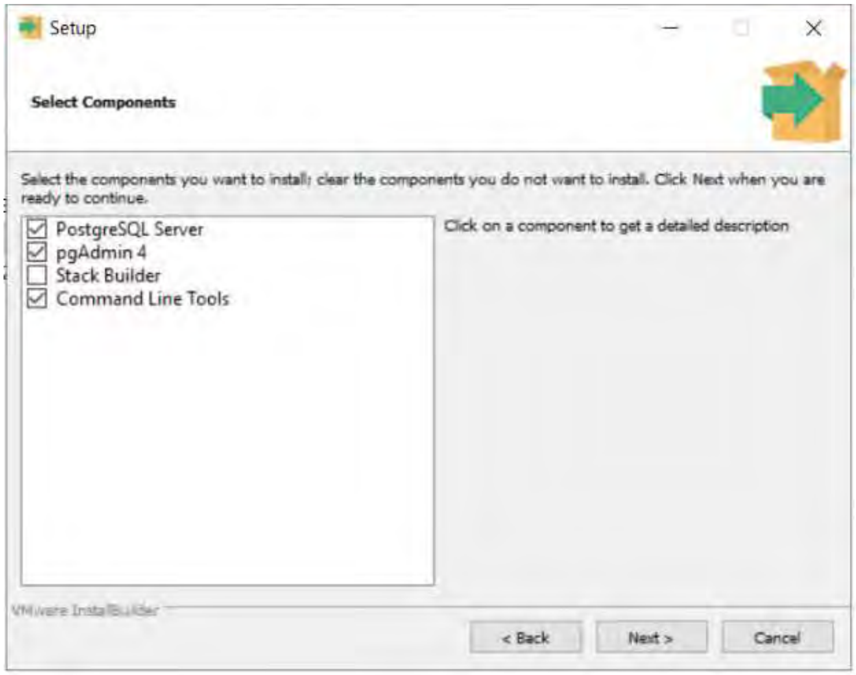
Welcome to the PostgreSQL Setup Wizard.



Installation Directory

Please specify the directory where PostgreSQL will be installed.

Installation Directory C:\Program Files\PostgreSQL\12



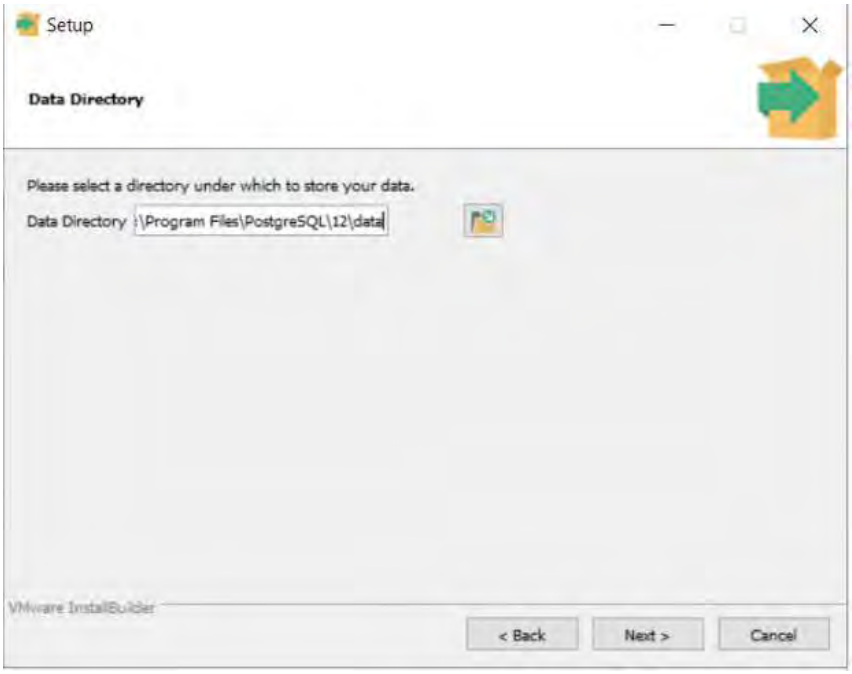
Setup

Select Components

Select the components you want to install; clear the components you do not want to install. Click Next when you are ready to continue.

☑ PostgreSQL Server
☑ pgAdmin 4
☐ Stack Builder
☑ Command Line Tools

Click on a component to get a detailed description

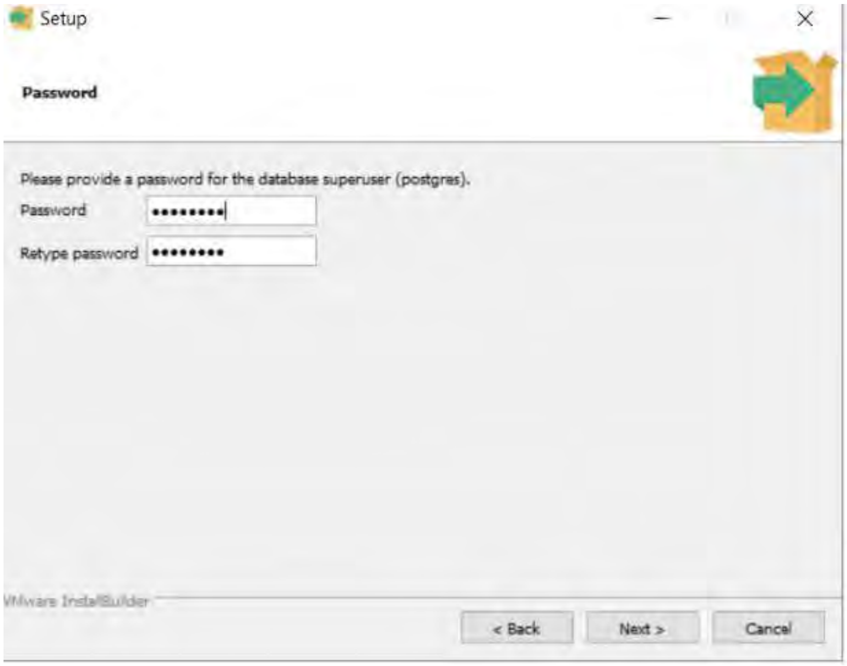


Setup

Data Directory

Please select a directory under which to store your data.

Data Directory :\Program Files\PostgreSQL\12\data



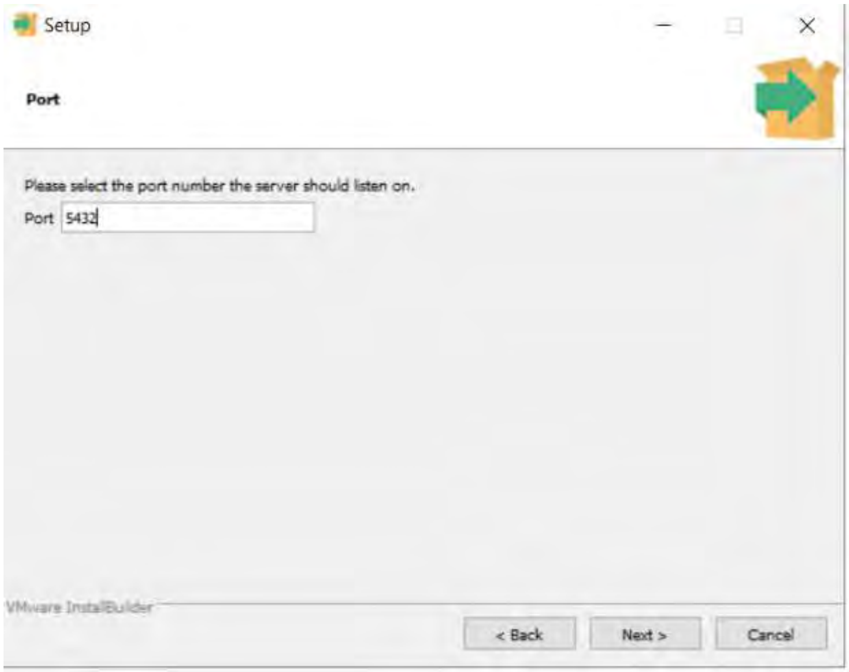
Setup

Password

Please provide a password for the database superuser (postgres).

Password •••••••••

Retype password •••••••••

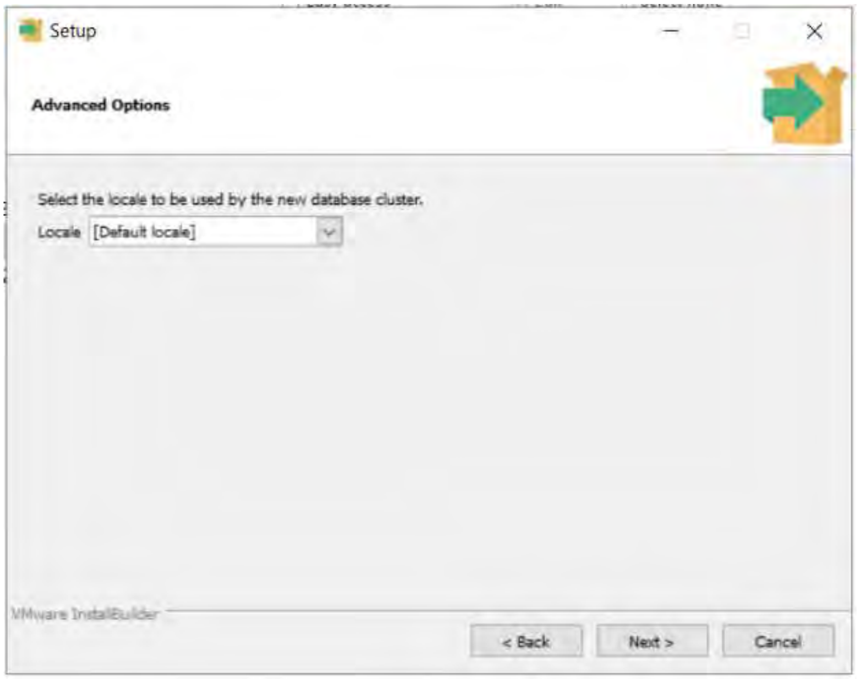


Setup

Port

Please select the port number the server should listen on.

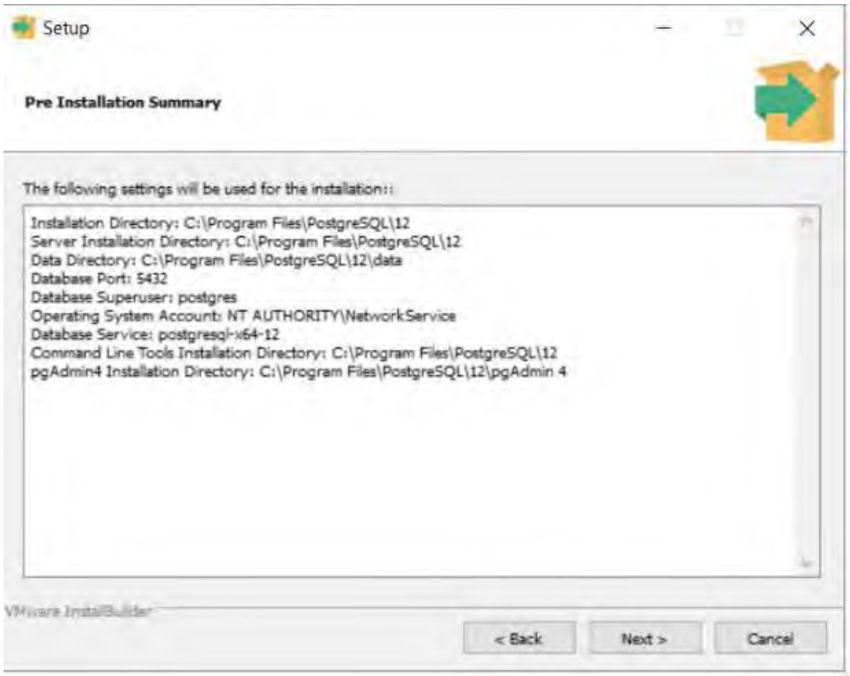
Port 5432



Advanced Options

Select the locale to be used by the new database cluster.

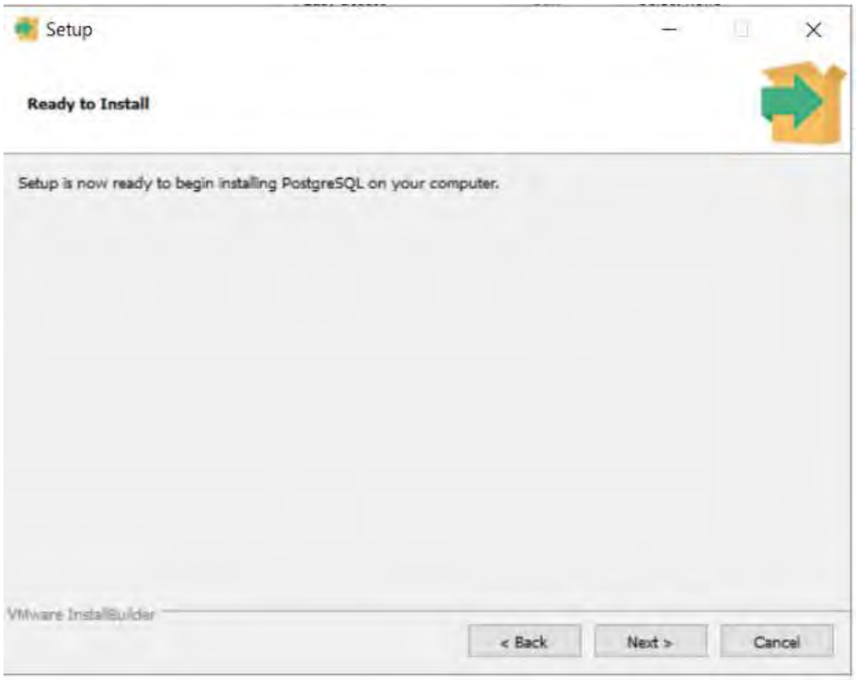
Locale [Default locale]



Pre Installation Summary

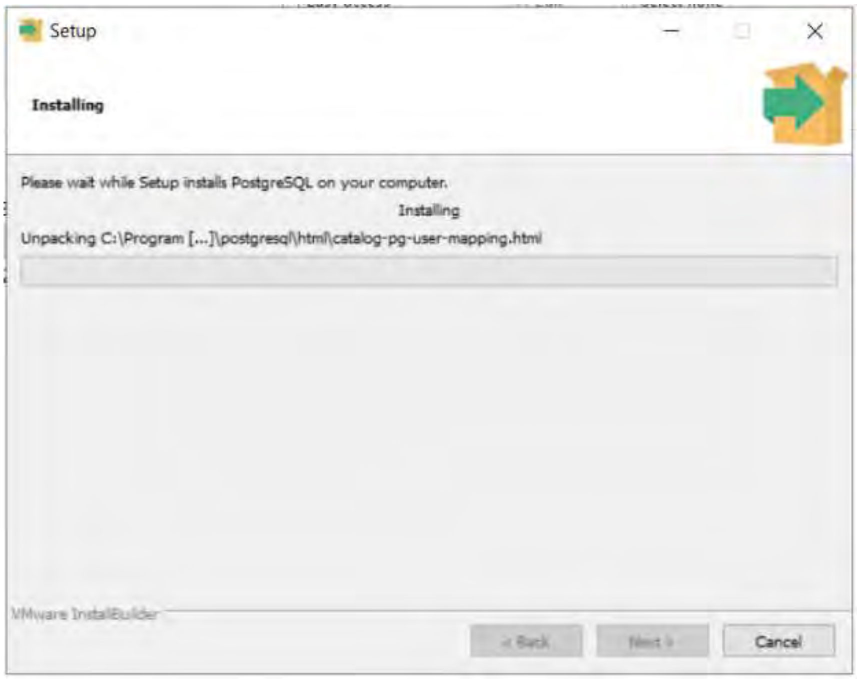
The following settings will be used for the installation::

```
Installation Directory: C:\Program Files\PostgreSQL\12
Server Installation Directory: C:\Program Files\PostgreSQL\12
Data Directory: C:\Program Files\PostgreSQL\12\data
Database Port: 5432
Database Superuser: postgres
Operating System Account: NT AUTHORITY\NetworkService
Database Service: postgresql-x64-12
Command Line Tools Installation Directory: C:\Program Files\PostgreSQL\12
pgAdmin4 Installation Directory: C:\Program Files\PostgreSQL\12\pgAdmin 4
```



Ready to Install

Setup is now ready to begin installing PostgreSQL on your computer.

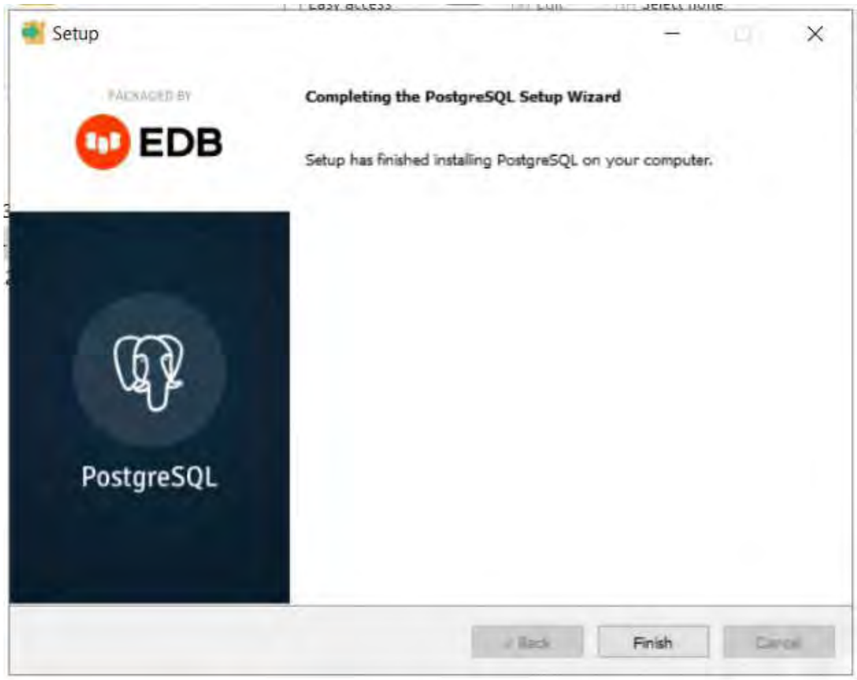


Installing

Please wait while Setup installs PostgreSQL on your computer.

Installing

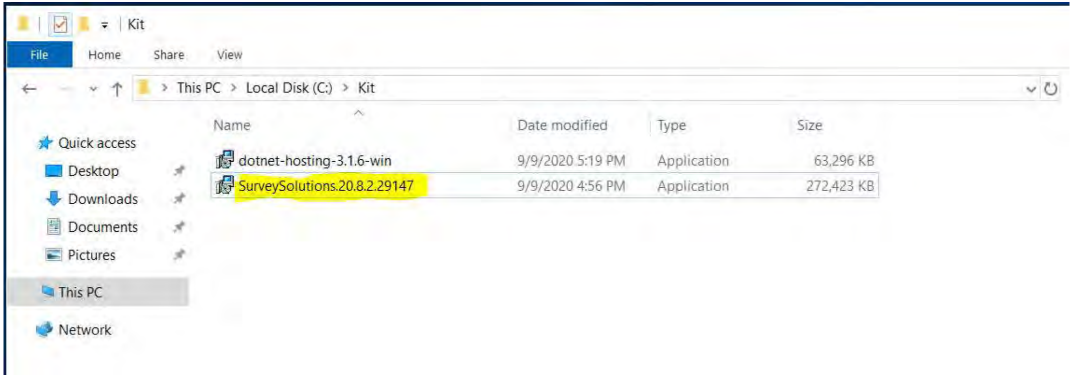
Unpacking C:\Program [...]\postgresql\html\catalog-pg-user-mapping.html



Completing the PostgreSQL Setup Wizard

Setup has finished installing PostgreSQL on your computer.

5. Install Survey Solutions 20.8.2.29147:



Name	Date modified	Type	Size
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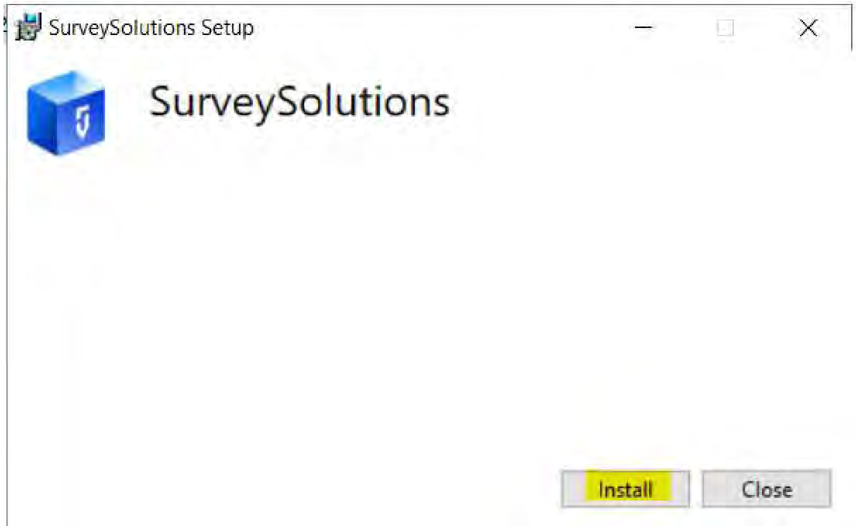
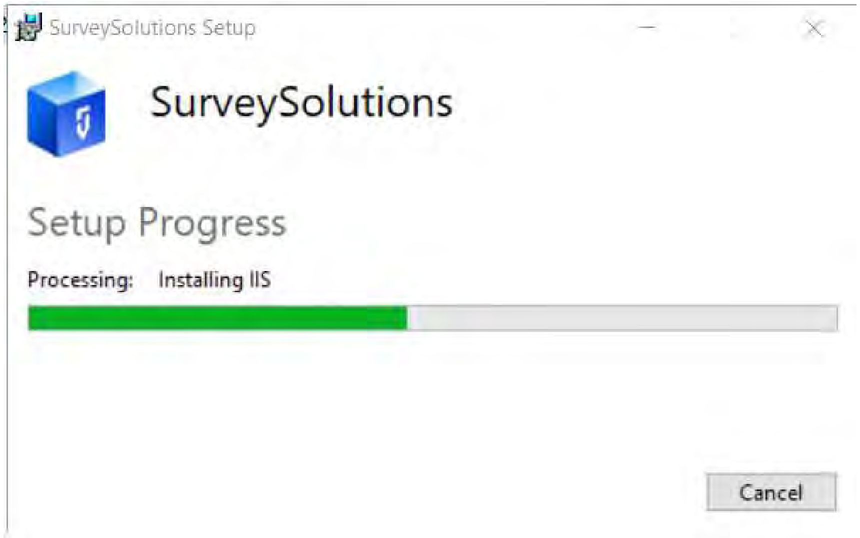


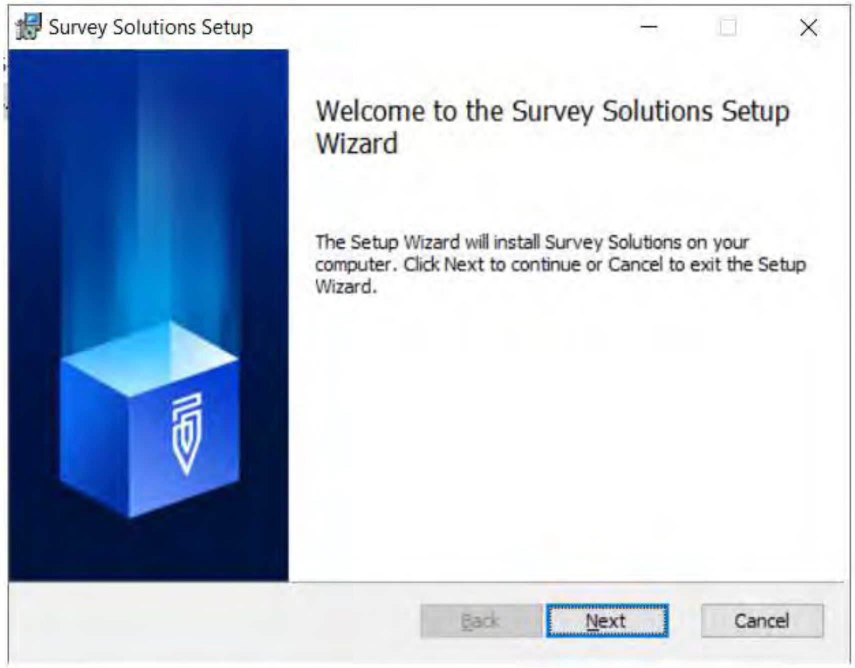


SurveySolutions Setup

SurveySolutions

Setup Progress

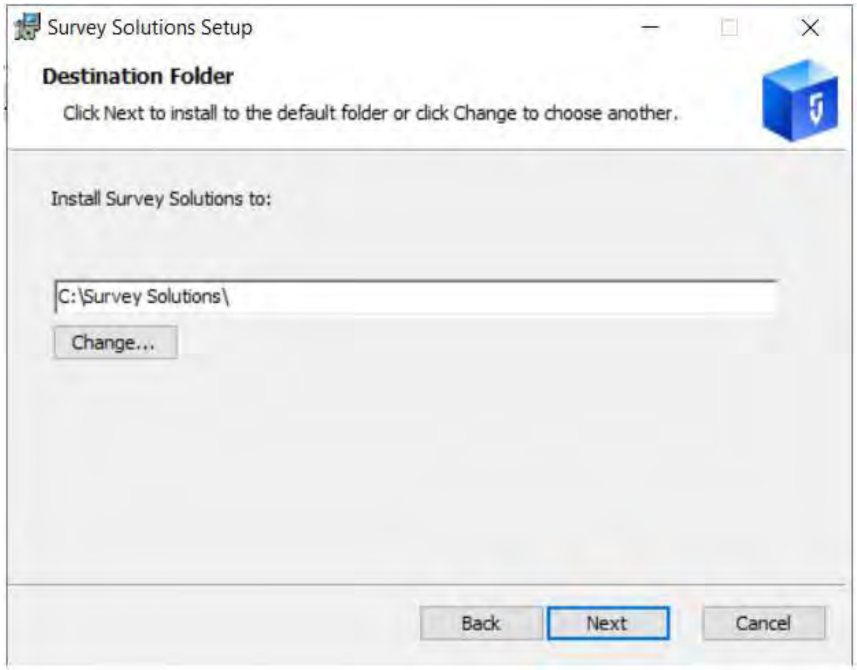
Processing: Installing IIS



Survey Solutions Setup

Welcome to the Survey Solutions Setup Wizard

The Setup Wizard will install Survey Solutions on your computer. Click Next to continue or Cancel to exit the Setup Wizard.



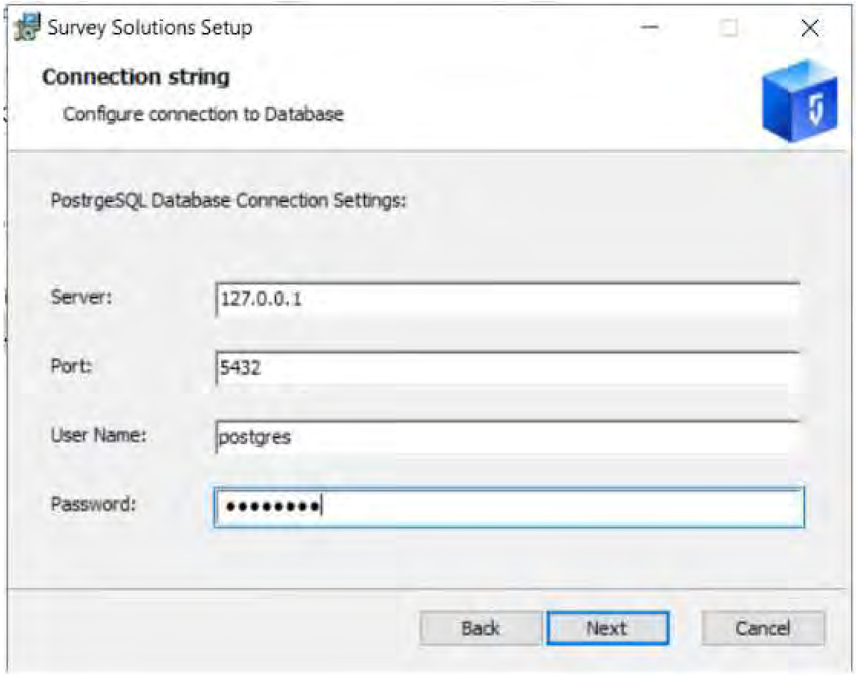
Survey Solutions Setup

Destination Folder

Click Next to install to the default folder or click Change to choose another.

Install Survey Solutions to:

C:\Survey Solutions\



Survey Solutions Setup

Connection string

Configure connection to Database

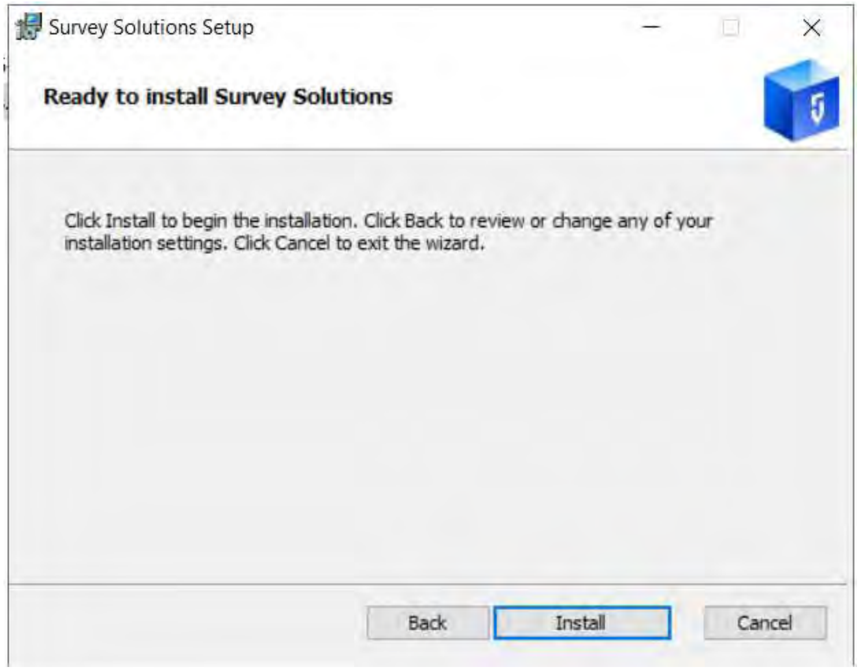
PostrgeSQL Database Connection Settings:

Server: 127.0.0.1

Port: 5432

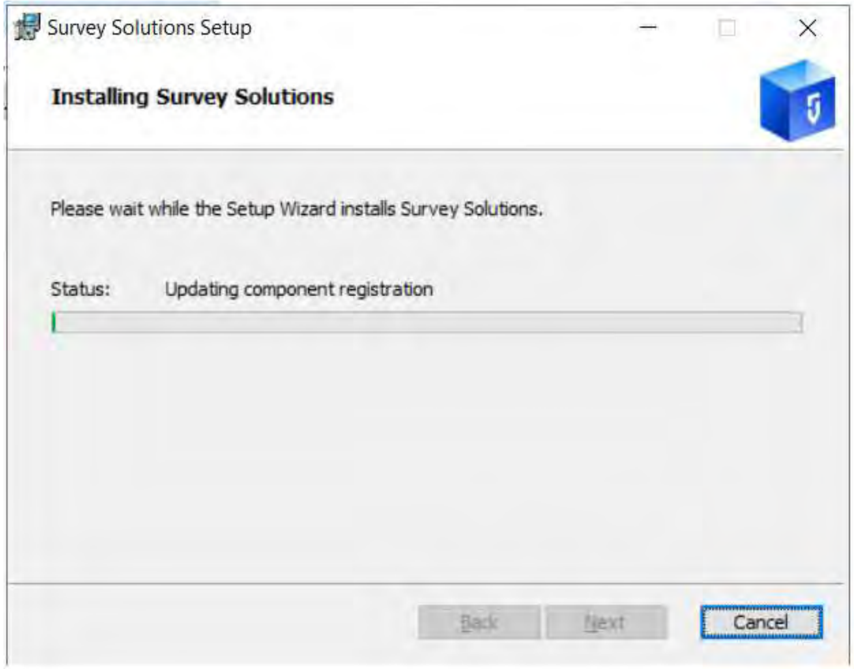
User Name: postgres

Password: ••••••••



Ready to install Survey Solutions

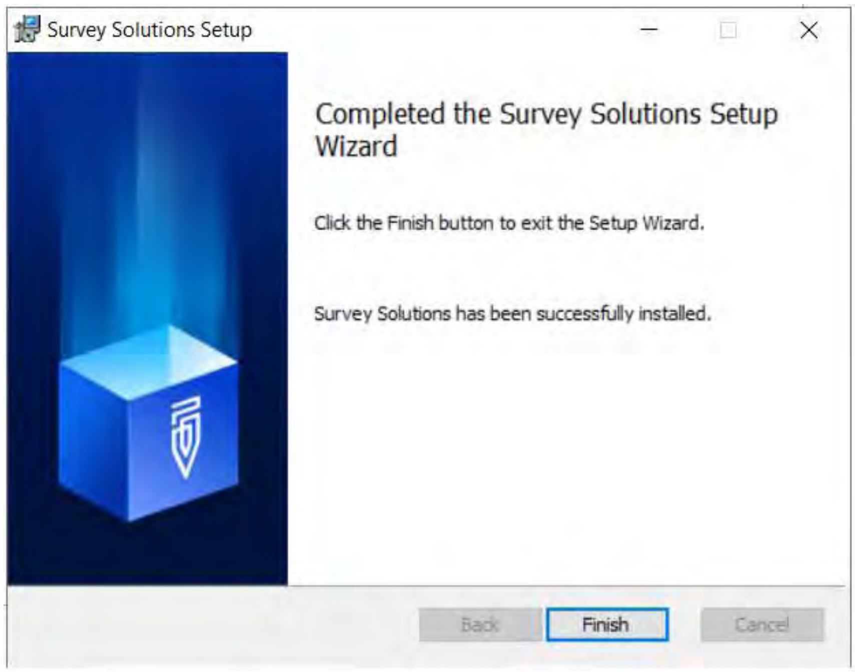
Click Install to begin the installation. Click Back to review or change any of your installation settings. Click Cancel to exit the wizard.



Installing Survey Solutions

Please wait while the Setup Wizard installs Survey Solutions.

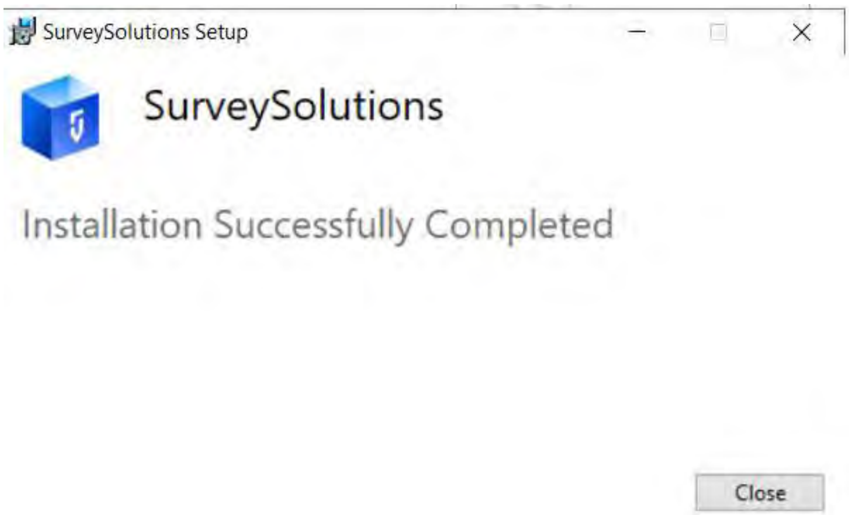
Status: Updating component registration



Completed the Survey Solutions Setup Wizard

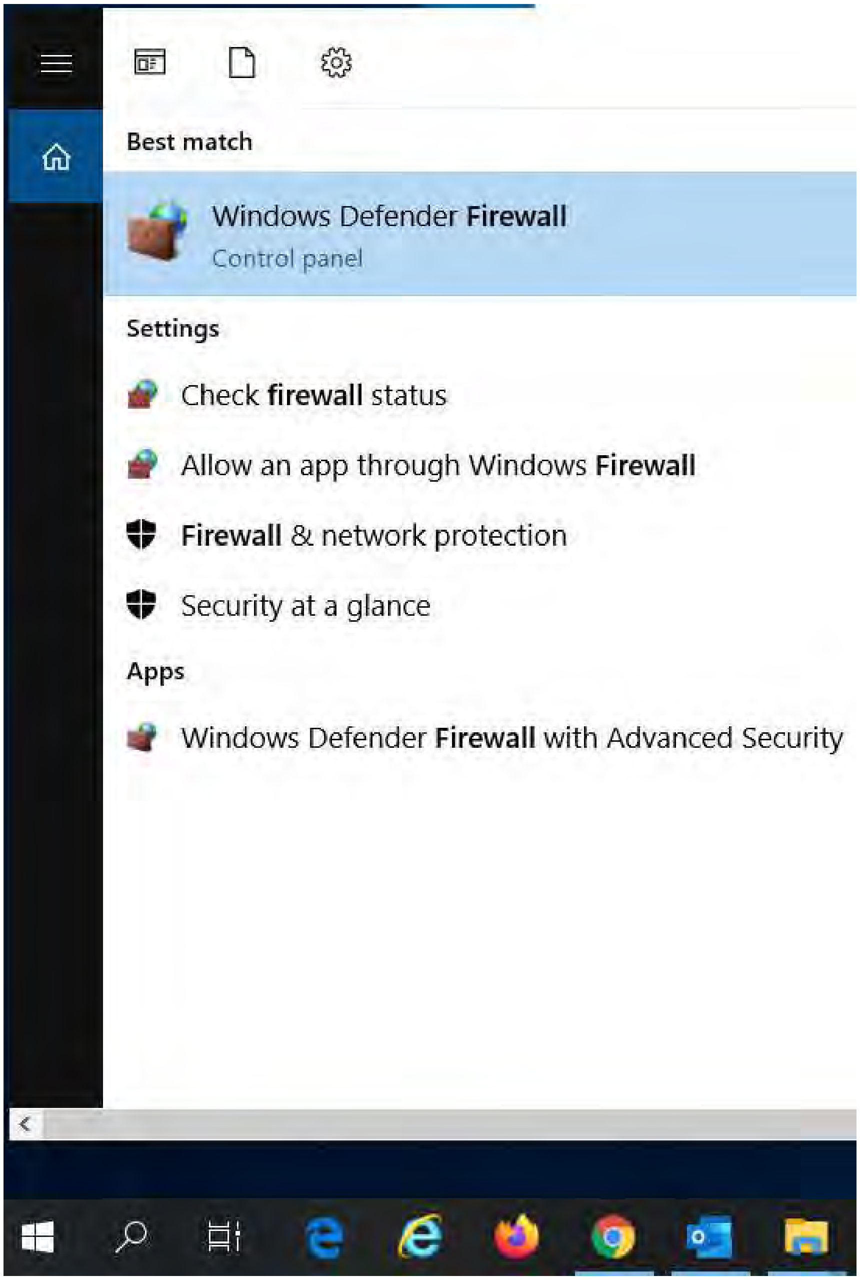
Click the Finish button to exit the Setup Wizard.

Survey Solutions has been successfully installed.



Installation Successfully Completed

6. Allow communication from load balancer by adding firewall rules:
Open Windows Defender Firewall



Best match

Windows Defender Firewall
Control panel

Settings

Check firewall status

Allow an app through Windows Firewall

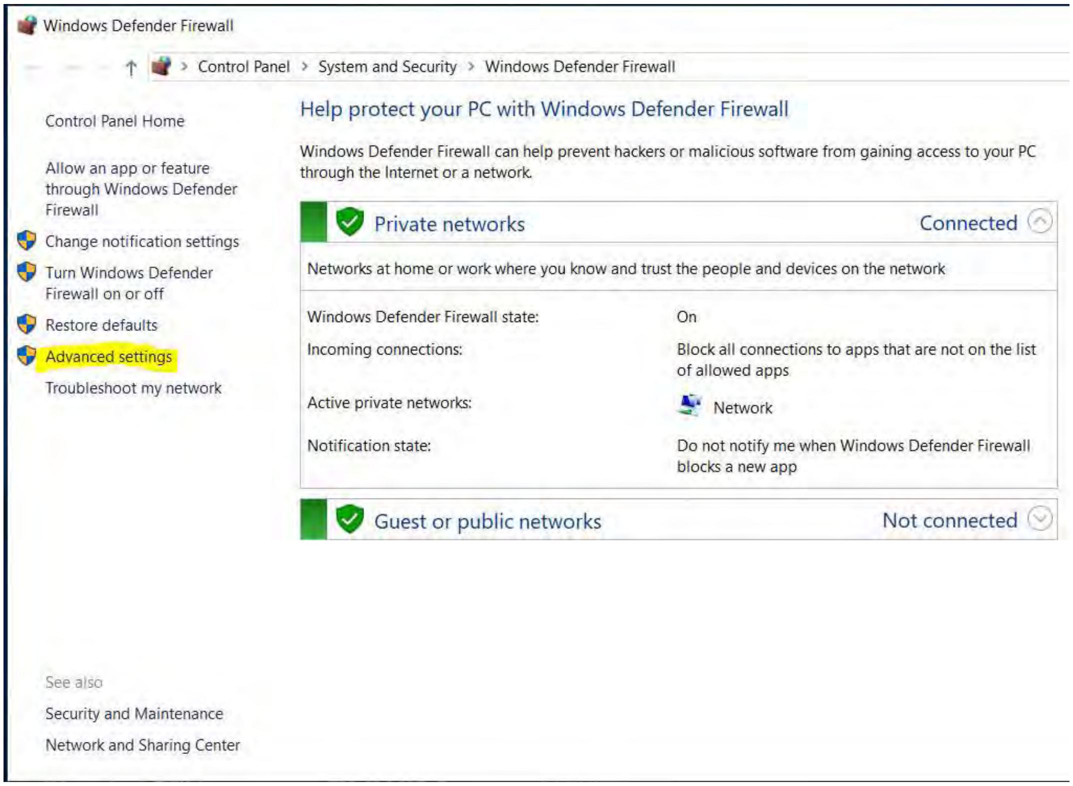
Firewall & network protection

Security at a glance

Apps

Windows Defender Firewall with Advanced Security

Go to “Advanced settings”


Windows Defender Firewall
Control Panel > System and Security > Windows Defender Firewall
Control Panel Home
Allow an app or feature through Windows Defender Firewall
Change notification settings
Turn Windows Defender Firewall on or off
Restore defaults
Advanced settings
Troubleshoot my network
See also
Security and Maintenance
Network and Sharing Center

Help protect your PC with Windows Defender Firewall

Windows Defender Firewall can help prevent hackers or malicious software from gaining access to your PC through the Internet or a network.

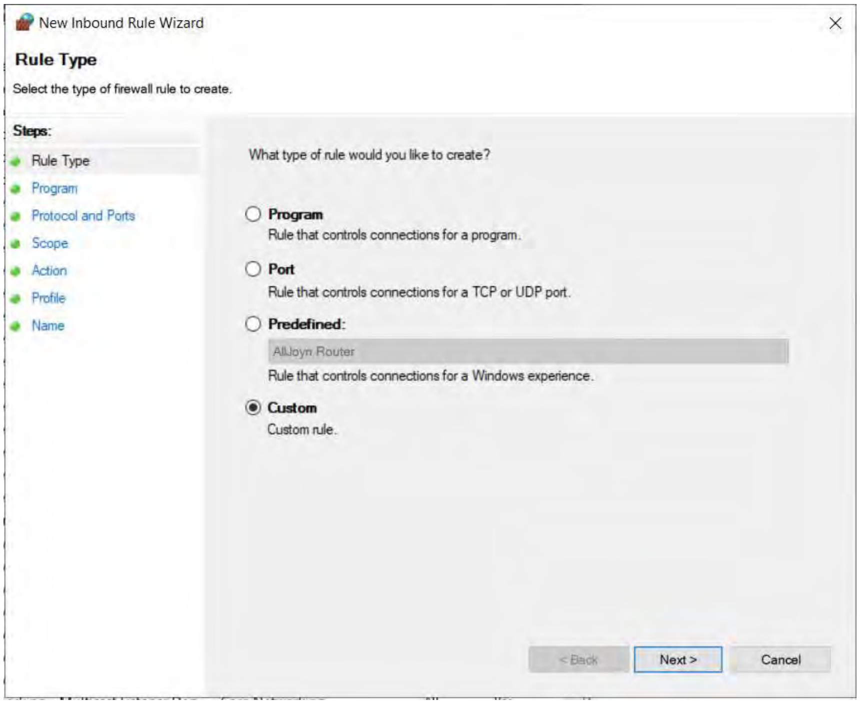
Private networks — Connected

Networks at home or work where you know and trust the people and devices on the network

Windows Defender Firewall state:	On
Incoming connections:	Block all connections to apps that are not on the list of allowed apps
Active private networks:	Network
Notification state:	Do not notify me when Windows Defender Firewall blocks a new app

Guest or public networks — Not connected

Create a new inbound rule by left clicking on the “Inbound Rules”-> “New rule …”



Rule Type

Select the type of firewall rule to create.

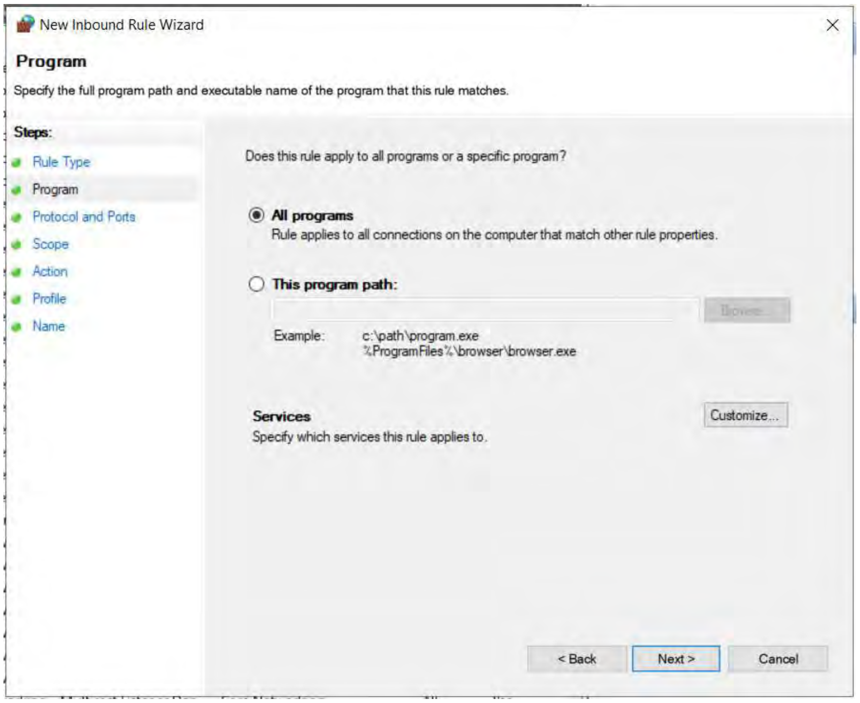
What type of rule would you like to create?

○ Program
Rule that controls connections for a program.

○ Port
Rule that controls connections for a TCP or UDP port.

○ Predefined:
AllJoyn Router
Rule that controls connections for a Windows experience.

● Custom
Custom rule.



Program

Specify the full program path and executable name of the program that this rule matches.

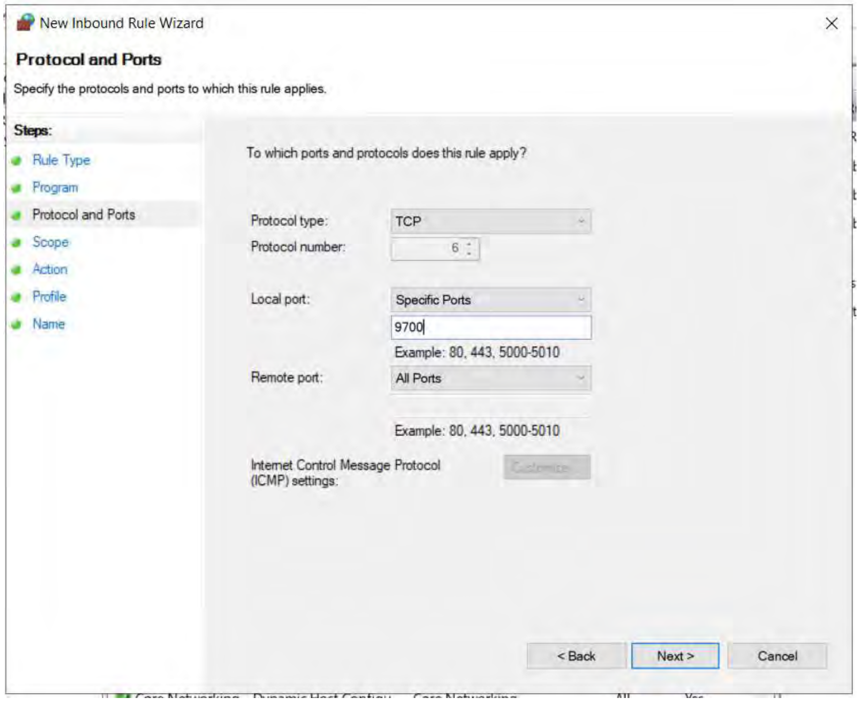
Does this rule apply to all programs or a specific program?

● **All programs**
Rule applies to all connections on the computer that match other rule properties.

○ **This program path:**

Example: c:\path\program.exe
%ProgramFiles%\browser\browser.exe

Services
Specify which services this rule applies to.

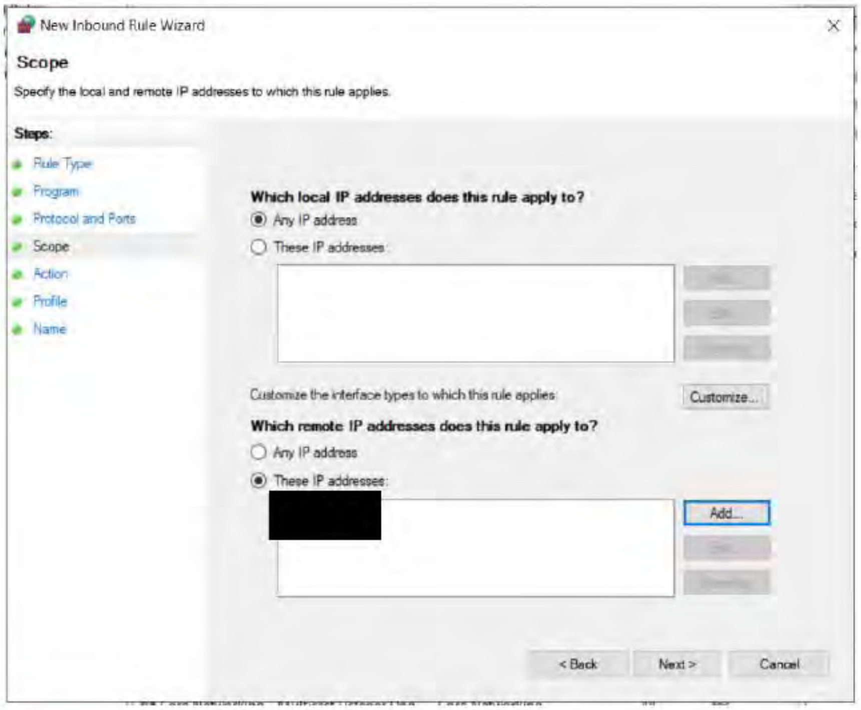


Protocol and Ports

Specify the protocols and ports to which this rule applies.

To which ports and protocols does this rule apply?

Protocol type: TCP
Protocol number: 6
Local port: Specific Ports
9700
Example: 80, 443, 5000-5010
Remote port: All Ports
Example: 80, 443, 5000-5010
Internet Control Message Protocol (ICMP) settings:



Scope

Specify the local and remote IP addresses to which this rule applies.

Which local IP addresses does this rule apply to?

● Any IP address

○ These IP addresses:

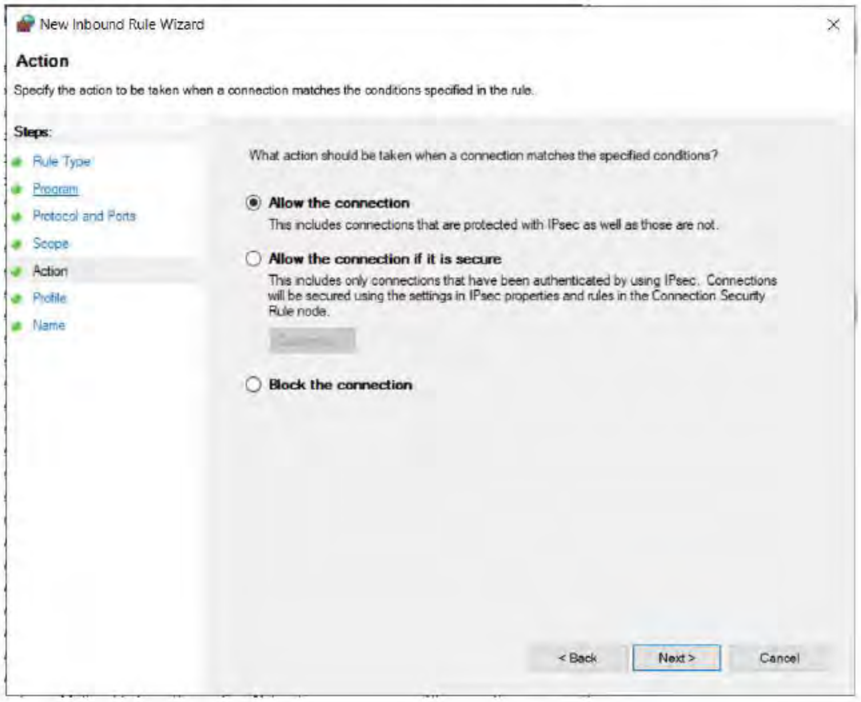
Customize the interface types to which this rule applies:

Which remote IP addresses does this rule apply to?

○ Any IP address

● These IP addresses:

[redacted]



Action

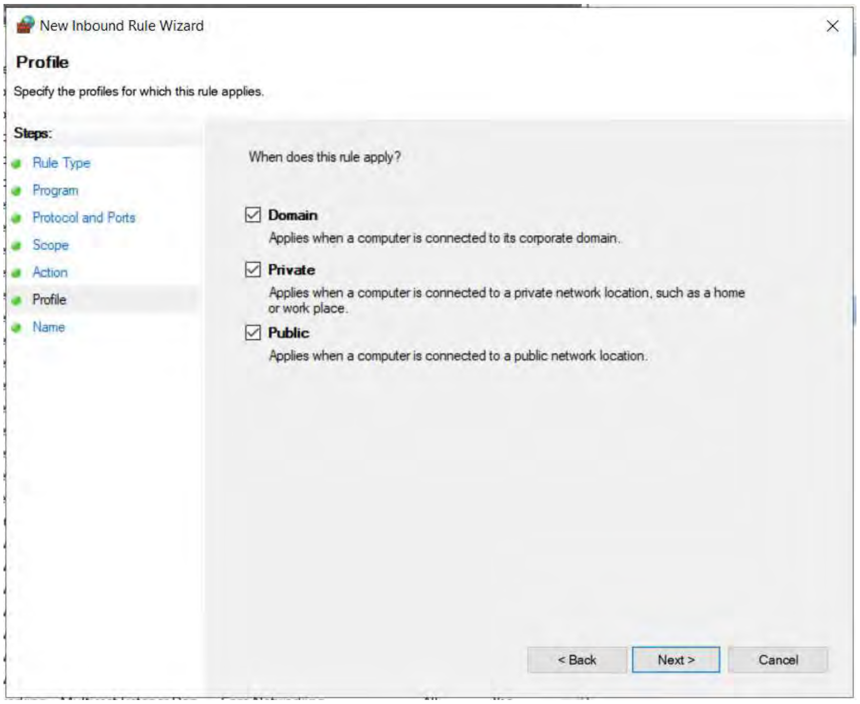
Specify the action to be taken when a connection matches the conditions specified in the rule.

What action should be taken when a connection matches the specified conditions?

● **Allow the connection**
This includes connections that are protected with IPsec as well as those are not.

○ **Allow the connection if it is secure**
This includes only connections that have been authenticated by using IPsec. Connections will be secured using the settings in IPsec properties and rules in the Connection Security Rule node.

○ **Block the connection**



Profile

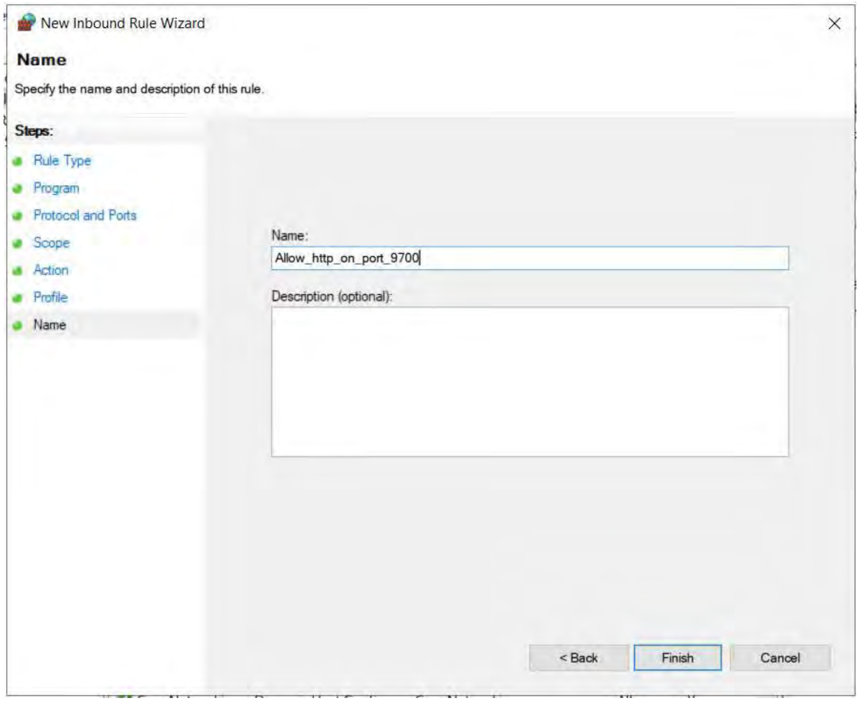
Specify the profiles for which this rule applies.

When does this rule apply?

☑ **Domain**
Applies when a computer is connected to its corporate domain.

☑ **Private**
Applies when a computer is connected to a private network location, such as a home or work place.

☑ **Public**
Applies when a computer is connected to a public network location.



Name

Specify the name and description of this rule.

Name:
Allow_http_on_port_9700

Description (optional):

7. Edit C:\Survey Solutions\Site\appsettings.production as follows and restart IIS. Note that PostgreSQL password is masked and Capcha and GoogleMap sections contains settings tied to a personal Google subscription, so should be replaced with INS Google subscription keys:

```
[Headquarters]

BaseUrl=https://rga.insse ro

TenantName=hq

[Apks]
```

```
ClientApkPath=Client

[Designer]

DesignerAddress=https://designer mysurvey.solutions

[FileStorage]

AppData=..\Data_Site

TempData=..\Data_Site

[ConnectionStrings]

DefaultConnection=Persist Security Info=true;Server=127.0.0.1;Port=5432;User Id=postgres;Password=********;Database=SurveySolutions

[Captcha]

CaptchaType=Recaptcha

SecretKey=6LefktQZAAAAAJIIId24movW7-9kfc74O5qSzD5e

SiteKey=6LefktQZAAAAACHBtdRE3AbDbAlBGwa-MvGZE4AK

Version=v2

[GoogleMap]

ApiKey=AIzaSyCrg8h3FK1rfiNWQFK3M-fBnWaCr0wI760

ApiBaseUrl=https://maps.googleapis.com

BaseUrl=https://google.com
```

Annex 2 – Maintenance procedures for GAC environment

In order to maintain functional testing environment for RGA, some relevant procedures are required. Those procedures consist in:

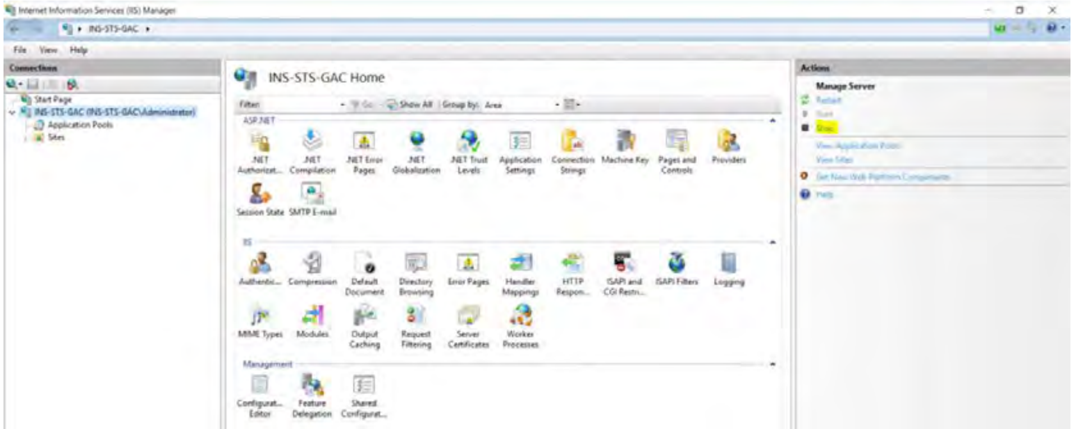
- Initializing the environment
- Patching and updating WORLD BANK software when functional issues are addressed in the source code
- Monitoring the environment

In order to be able to run those procedures, a VPN connection is required to the RGA environment, hosted by STS.

1. GAC environment initialization

In order to initialize GAC environment, the most suitable way is to clear the database. Since some settings are encoded in database, additional steps are required in order to prepare the environment for subsequent load tests. The whole procedure is described here:

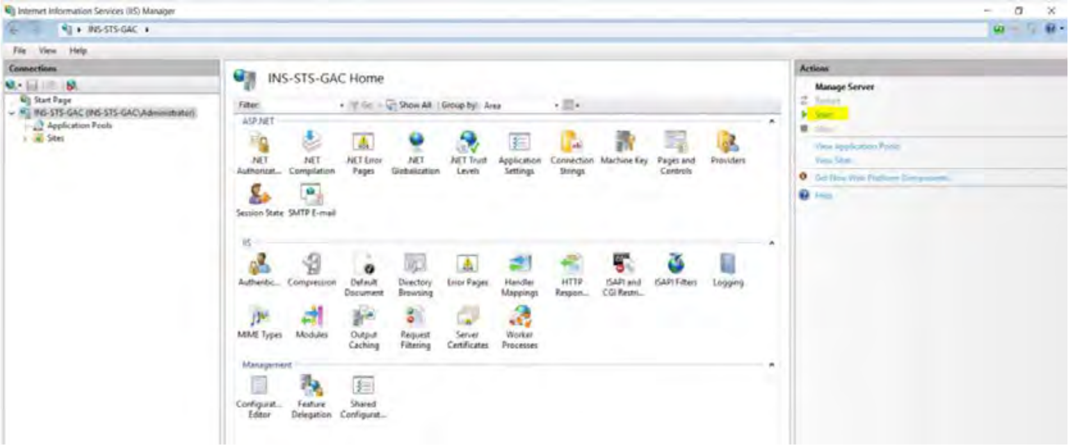
1. Access INS-STS-GAC and stop IIS service (Start->Windows Administrative Tools->Internet Information Service (IIS) Manager):



2. Run psql command line tool (Start->PostgeSQL 12-> SQL Shell) and drop drop the database "SurveySolutions":

```
Server [localhost]:

Database [postgres]:

Port [5432]:

Username [postgres]:

Password for user postgres:

psql (12.4)

WARNING: Console code page (437) differs from Windows code page (1252)

         8-bit characters might not work correctly. See psql reference

         page "Notes for Windows users" for details.

Type "help" for help.

postgres=# drop database "SurveySolutions";
```

3. Start IIS service (Start->Windows Administrative Tools->Internet Information Service (IIS) Manager):



4. Click on Survey Solution icon on the desktop and provide default administrator credentials

5. Setup Survey Solution application as recommended by World Bank:

- Create minimal set of users (headquarter, supervisor, interviewer roles)
- Import questionnaire from Survey Solution Designer
- Assign questionnaire to interviewer user in web mode and start web mode

2. Patching and updating World Bank software

World Bank software components for RGA environment consist in:

- Survey Solution Headquarter application installed on INS-STS-GAC

For patching and updating Survey Solution application, the steps below must be executed:

1. Consult https://support mysurvey.solutions/release-notes/ and decide if new release should be deployed.
2. In case there will be a deployment, copy C:\Survey Solutions\Site\appsettings.production in a safe location for INS-STS-GAC.
3. On INS-STS-GAC uninstall Survey Solutions application, restart the node and install new release from https://mysurvey.solutions/en/index html#download-section.
4. On INS-STS-GAC, copy appsettings.production from the safe location in C:\Survey Solutions\Site\appsettings.production and restart IIS.

3. Monitor GAC environment

For monitoring GAC environment there is no specialized monitoring system deployed. Since all components are installed on the same virtual machine, resource monitoring can be done by simply launching Task Manager.

As for applications logs, those are available in C:\Survey Solutions\logs.

ROMANIA

Reimbursable Advisory Services Agreement on Romania Capacity Building for Statistics (P167217)

OUTPUT No. 14

Report on two (2) five-day workshops for NIS statisticians in methodologies and tools for transforming questionnaires into intelligent statistical e-questionnaires

June 2022

Revised version July 2022

Project co-financed from the European Social Fund through the Operational Programme for Administrative Capacity 2014-2020

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This report has been delivered in June 2022 and revised in July 2022, under the Reimbursable Advisory Services Agreement on Romania Capacity Building for Statistics (P167217) signed between the National Institute of Statistics in Romania and the International Bank for Reconstruction and Development on September 17, 2019. It is part of Output 14 under the above-mentioned agreement.

TABLE OF CONTENTS

List of Acronyms

API	Application Programming Interface
CAPI	Computer-Assisted Personal Interviewing
CAWI	Computer-Assisted Web Interviewing
GAC	General Agriculture Census
INS	National Institute of Statistics
LINQ	Language Integrated Query
PAPI	Paper and Pencil Interviewing
RAS	Reimbursable Advisory Services
WB	World Bank

Introduction

This report presents the advisory services provided during the "**two (2) five-day workshops for NIS statisticians in methodologies and tools for transforming questionnaires in intelligent statistical e-questionnaires**" as part of Output 14 under the Reimbursable Advisory Services (RAS) Agreement on Romania Capacity Building for Statistics (Project No. P167217). The project is implemented by the National Institute of Statistics (INS) with support from the World Bank (WB).

Through this Output, support was provided to the National Institute of Statistics (INS) for preparing the implementation of the General Agriculture Census round 2020 and for documenting the process of elaborating the electronic questionnaires for major statistical works on agriculture. The advisory services consisted of two five-day workshops on the Survey Solutions Designer App. The workshops were attended by 28 persons in case of the first workshop for beginners, and 25 persons in case of the second one for advanced users. The knowledge gained by the participants will support the preparatory work for the post GAC surveys (structural surveys in agriculture).

The report presents the process for organizing the workshops and the activities performed, the topics covered, the agenda, the materials developed, the observations of the experts/trainers and several conclusions and recommendations for further improving the skills of the INS statisticians. The materials produced for the workshops are available in electronic format and are described in the annexes of this report.

The participants in the workshops offered feedback on the process, knowledge, and skills acquired, showing good understanding of the principles, concepts, tools, and processes of creating templates for data collections for different types of surveys. Among the skills acquired, the participants can now use different tools and methodologies associated with the preparation of nationwide surveys.

1. Preparation of the workshops

The INS carries out year by year sampling surveys at national or regional level to produce statistics related to the agriculture sector in line with the requirements of national or international legislation and as stated in the Annual National Statistics Program. At the INS level, the methods of data collection vary from PAPI to CAPI or CAWI. In its effort to modernize the statistics production one important step of the INS is to transform questionnaires into electronic/intelligent e-questionnaires. In this context, through the RAS, two workshops have been organized, of five days each, for knowledge transfer on producing e-questionnaires in beginner and advanced conditions for INS specialists involved in production of agriculture statistics.

A group of 28 experts were selected and nominated by the INS to attend the workshops. Most of the selected experts participated in both workshops, initially in the one for beginners, held in February 2020, in a face-to-face approach, and subsequently in the one for advanced users, held in October 2021, online, as the COVID-19 pandemic limited the possibilities of face-to-face meetings and collective activities.

Considering the needs of the participants and the requirements for preparing the e-questionnaires, the objectives of the workshops were to: (i) provide knowledge on the Survey Solution Designer application components; (ii) train participants in creating a basic questionnaire: the interface of the Designer app, the different basic and novel components of a questionnaire template, multilingual questionnaires, picture attachments and the collaboration features included in the Designer application; iii) the use of the C# language in the Survey Solution Designer application, functions and syntax, exceptions in expressions, useful expressions and type of questions, LINQ and lambda functions, lookup tables, different validations and enabling conditions and patterns; (iv) explain the differences in designing questionnaires for CAPI and CAWI surveys; and (v) practice the development of e-questionnaires. Both workshops covered subjects related to the process of preparing questionnaire templates for data collections for different types of surveys.

In organizing the workshops, the following main activities were considered:

- Workshop preparation: the focus was on identifying the topics responding to the needs for knowledge transfer. The topics of the workshops and the agenda were set together by the WB experts and the INS specialists. The production of materials and accessories necessary for organizing the classes (presentations, case studies, login application access) were prepared by the WB experts covering the agreed topics. The premises and the equipment for organizing the workshops were provided by the INS.
- Workshop delivery and results: following agreement on the scope and agenda, two five-day workshops were delivered by the WB experts to the participants selected and nominated by the INS, in the format of face-to-face, respectively online, during the periods agreed. The participants were allowed to use Survey Solutions Designer and practice on developing questionnaires and use examples.

2. Activities performed

Workshops' preparation

The preparation of the workshops was based on topics covering the needs for developing the e-questionnaires identified by the WB experts and INS specialists and agreed as part of the agenda.

The topics for the beginner users' workshop were:

- Survey Solutions overview
- Designer dashboard and Questionnaire editor
- Questionnaire components and actions with them
- Basic question types (text, numeric, list, and Date questions).
- Tester application and Web-Tester
- Categorical questions and reusable categories
- Questionnaire history
- Rosters
- Novel questions
- Functions and syntax
- Enabling conditions and validation rules
- Macrosses, variables
- Attachments and text-formatting, and substitutions
- Resources and communication with Survey Solutions
- Collaboration, comments and PDF version of the questionnaire

The topics for the advanced users' workshop were:

- New features in Survey Solutions
- Roster's display modes
- Multi-select combobox
- Collections of categories
- Classifications
- Test Scenarios
- Functions and Syntax
- Dealing with exceptions in expressions
- Useful expressions for a set of questions
- Useful expressions for date type questions
- LINQ and lambda functions
- Selection of member/item within a category
- Random selection
- Lookup tables
- Conditions in Household/agriculture holding rosters
- Linked questions and filters for them
- Rosters and enabling conditions
- Introduction to CAWI.

Based on the topics agreed, as above, the agenda for each type of workshop was developed (see Annex 1). The experts also developed training materials that included presentations, training exercises, video compilations and relevant online articles for the Survey Solutions support page.

Presentation materials and training questionnaires with exercises are attached in electronic form (archive available) to be put at the disposal of the participants and the INS (see Annex 2 and Annex 3 to this report).

The video materials are available on the YouTube channel of Survey Solutions: https://www.youtube.com/channel/UCzGrZ3FiEu5NbDJB2GKazOA
Online help can be found on the Survey Solutions support portal: http://support.mysurvey.solutions.

Workshop delivery and results

The first workshop for the beginners was delivered face-to-face during 17-21 of February 2020 for 28 participants. The second workshop was held in an on-line format for the advanced users during 18-22 of October 2021, for 25 participants, a measure imposed by the COVID-19 pandemic. The list of participants is available at the INS for both workshops.

The workshops were delivered following several key principles:

- **Interaction:** Participants were encouraged to engage in the workshop discussions. All sessions of the workshop covered topics and practical activities that generated interesting discussions and exchanges of ideas.
- **Practicality:** Examples were based on real situations for the Romanian statistics and the international experience. They were used to contextualize the needed tools for e-questionnaire development for census and inter-census periods and highlight their usefulness in addressing relevant issues.
- **Learner (participant) - centered:** Participants were encouraged to propose examples from their own experience to apply the means, approaches and methodologies taught.
- **Complementarity:** Experts highlighted links, connections and complementarity of content across the different sessions of workshops whilst avoiding duplication and overlap.

Different teaching and coaching methods and tools used for e-questionnaires development were used intensively during the workshops, among which:

- Presentation (in PowerPoint)
- Sample of questionnaires
- Survey Solution Designer application
- Brainstorming
- Case studies
- Q&A sessions

As a result of the workshops, the participants were taught how to write a basic enablement and validation conditions. Also, participants learned to write beginner validation, enablement and filter expressions using the C# programming language and LINQ expressions.

Besides some technical difficulties in terms of internet connection during the face-to-face workshop the knowledge transferred to the participants was well delivered and appreciated by them. In the case of the advanced workshop (online), all equipment and connections worked very well for the entire period. An Interviewer account was created for each participant, and they had the opportunity to work through the Supervisor and Headquarter accounts on the examples presented during the workshop.

Examples of the administration and production of data for a questionnaire, including pre-loading data into the questionnaire (https://designer.mysurvey.solutions/questionnaire/details/9219f3fcadcc456694629a1721685327) were presented during workshop. The demonstration of automatic approval of the completed questionnaires through the API method was made resulting in an R. script (Annex 3).

3. Conclusions and recommendations

The two workshops were designed to ensure an effective knowledge transfer from the experts of the WB to the participants through in-depth presentation and practice on the topics related to using Survey Solutions Designer App and transforming questionnaires into e-questionnaires. The participants were also taught the two different methods they can use to test questionnaires: 1) using the web-tester integrated with the Designer application and 2) using the Tester application on the tablet.

In terms of the advanced workshop, the participants were connected and active all day long in webex sessions and used the chat for questions and answers. The participants were familiar with the Survey Solution platform and this allowed the group to go through the topics in the rhythm corresponding to the daily program, without syncope. Moreover, the participants were active and performed the practical activities daily on a real collection server opened through the "self-service-portal" mechanism on the site https://mysurvey.solutions/ .

An important objective and expected result of the workshops was to establish teams within the INS which have information and can use the tools for designing the e-questionnaires.

One important result of advanced workshop was the hands-on practice on e-questionnaires applicable for current activities of the INS. Several issues were observed during training, allowing to make recommendations for improving the questionnaires, such as:

- rewriting some questions to be more suitable for the CAPI collection method.

- rewriting the explanations / instructions for some questions so that they are suitable for the respondent who will complete the questionnaire without an intermediary (enumerator/interview operator).

- for the CAWI mode, considering that a questionnaire will be completed by a person without the advice of an enumerator / interview operator, the questionnaire must be tested on a sample of people from as many professions as possible, with different levels of education and various ages, and depending on the way of interaction with the questionnaire to adapt for a better presentation of information, questions and sections.

- establishing the flow of administration and data collection, both before the design of the questionnaire, but also whenever it is necessary so that, at the end of the questionnaire, the training of the enumerators / interview operators is carried out correctly.

- testing the entire data collection and production flow, from the design stage (design), import and assignment (assignments), approval and rejection of questionnaires, the operation of each user role, to the export of collected data and transformation in microdata.

The working tools for preparing the e-questionnaires (login and access to Survey Solutions Designer App) are made available to the participants and can be used in the future in the process of revision or update of the e-questionnaires.

To strengthen and offer continuous support on preparing surveys by using CAPI/CAWI data collection methods and developing e-questionnaires, continuous training and coaching, in-house or outsourced, shall be provided to the INS specialists, both through specific trainings in using the Survey Solutions Designer App, and through workshops for transforming questionnaires into intelligent statistical e-questionnaires.

4. Annexes

Annex 1 - Agenda of workshops

Annex 2 - Presentations during workshops

Annex 3 - Questionnaire practice

Annex 1 – Agenda of workshops

1. Introductory/Beginner users' workshop agenda

Day 1

Time	Activities
08.30 – 09.30	Validation of participants and other technical issues
09:30 – 11.30	Survey Solutions Overview
11.15 – 11.30	Break
11.30 – 12.15	Designer dashboard and Questionnaire editor Questionnaire components and actions with them.
12.15 – 14.00	Break
14.00– 15.45	Basic question types (text, numeric, list, and Date questions).
15.45 – 16.00	Break
16.00 - 16.30	Tester application and Web-Tester.

Day 2

Time	Activities
08.30 – 09.30	Validation of participants and other technical issues
09:30 – 11.30	Categorical questions and reusable categories.
11.15 – 11.30	Break
11.30 – 12.15	Questionnaire history
12.15 – 14.00	Break
14.00– 15.45	Rosters part 1
15.45 – 16.00	Break
16.00 - 16.30	Rosters part 2

Day 3

Time	Activities
08.30 – 09.30	Validation of participants and other technical issues
11.15 – 11.30	Break
11.30 – 12.15	Functions and Syntax
12.15 – 14.00	Break
14.00– 15.45	Enabling conditions and validation rules. Validation in rosters.
15.45 – 16.00	Break
15.00 – 15.45	Macrosses, variables.

Day 4

Time	Activities
08.30 – 09.30	Validation of participants and other technical issues
09.30 – 11.15	Attachments and text-formatting, and substitutions.
11.15 – 11.30	Break
11.30 – 12.15	Translations.
12.15 – 14.00	Break
14.00– 15.45	Advanced categorical questions.Filters
15.45 – 16.00	Break
16.00 - 16.30	Resources and communication with Survey Solutions. Developing exercise

Day 5

Time	Activities
08.30 – 09.30	Validation of participants and other technical issues
09.30 – 11.15	Collaboration, comments and PDF version of the questionnaire.
11.15 – 11.30	Break
11.30 – 12.15	Scenarios based on AG questionnaire
12.15 – 14.00	Break
14.00– 15.45	Assessment
15.45 – 16.00	Break
16.00 - 16.30	Q&A and review of the training Conclusions

2. Advanced users' workshop agenda

Day 1

Time	Activities
08.30 – 09.30	Validation of participants and other technical issues
09.30 – 11.15	New features in Survey Solutions p1 a. Roster's display modes b. Multi-select Combobox
11.15 – 11.30	Break
11.30 – 12.15	New features in Survey Solutions p2. a. Collections of categories b. Classifications c. Test Scenarios
12.15 – 14.00	Break
14.00– 15.45	Functions and Syntax Dealing with exceptions in expressions Useful expressions for a set of questions
15.45 – 16.00	Break
16.00 - 16.30	Questions and answers Day 1

Day 2

Time	Activities
08.30 – 09.30	Validation of participants and other technical issues
09.30 – 11.15	Useful expressions for date type questions
11.15 – 11.30	Break
11.30 – 12.15	LINQ and lambda functions p.1
12.15 – 14.00	Break
14.00– 15.45	LINQ and lambda functions p.2 . Selection of member/item within a category
15.45 – 16.00	Break
16.00 - 16.30	Questions and answers Day 2

Day 3

Time	Activities
08.30 – 09.30	Validation of participants and other technical issues
09.30 – 11.15	Random selection p.1
11.15 – 11.30	Break
11.30 – 12.15	Random selection p.2
12.15 – 14.00	Break
14.00– 15.45	Lookup tables p.1 . Lookup tables p.2 .
15.45 – 16.00	Break
15.00 – 15.45	Questions and answers Day 3

Day 4

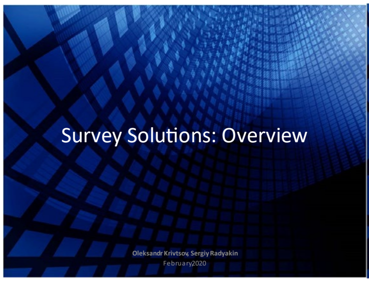
Time	Activities
08.30 – 09.30	Validation of participants and other technical issues
09.30 – 11.15	Conditions in Household/agriculture holding rosters
11.15 – 11.30	Break
11.30 – 12.15	Linked questions and filters for them
12.15 – 14.00	Break
14.00– 15.45	RosterVector in household/agriculture holding roster Rosters and enabling conditions
15.45 – 16.00	Break
16.00 - 16.30	Questions and answers Day 4

Day 5

Time	Activities
08.30 – 09.30	Validation of participants and other technical issues
09.30 – 11.15	Introduction to CAWI
11.15 – 11.30	Break
11.30 – 12.15	Assessment
12.15 – 14.00	Break
14.00– 15.45	Questions and answers Day 5
15.45 – 16.00	Break
16.00 - 16.30	Conclusions

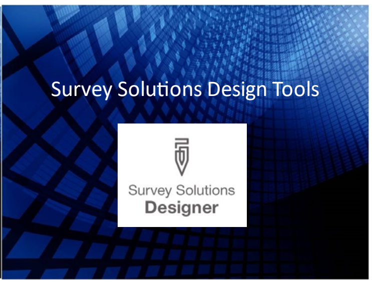
Annex 2 – Presentations during workshops

1. Presentations for beginner users' workshop (cover-pages)



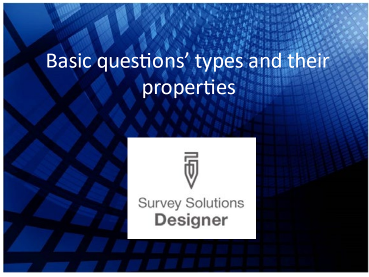
Survey Solutions: Overview

Oleksandr Krivtsov, Sergiy Radyakin
February2020



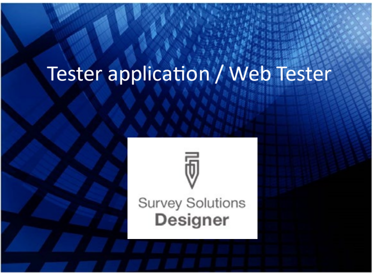
Survey Solutions Design Tools

Survey Solutions
Designer



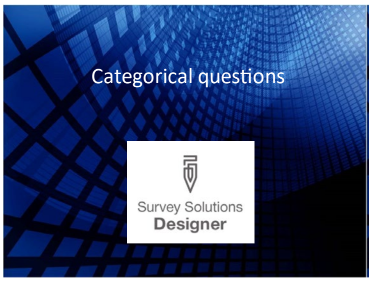
Basic questions' types and their properties

Survey Solutions
Designer



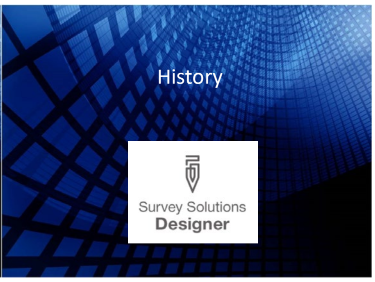
Tester application / Web Tester

Survey Solutions
Designer



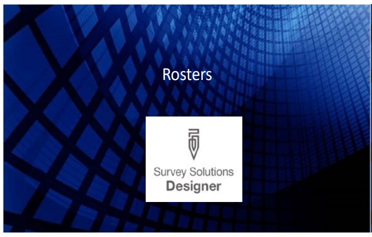
Categorical questions

Survey Solutions
Designer



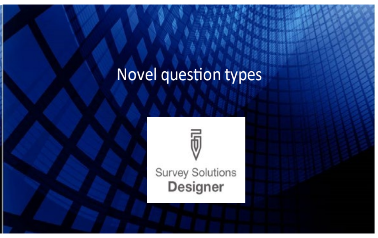
History

Survey Solutions
Designer



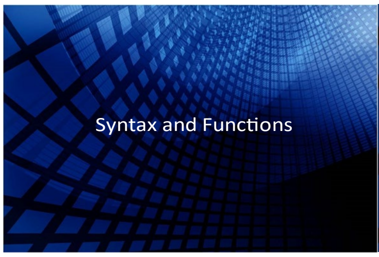
Rosters

Survey Solutions
Designer

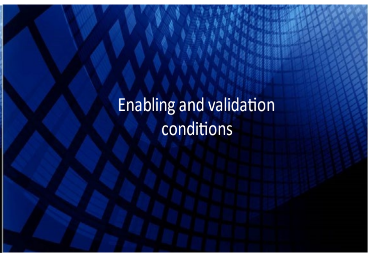


Novel question types

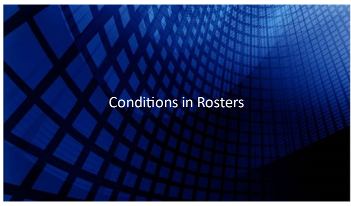
Survey Solutions
Designer



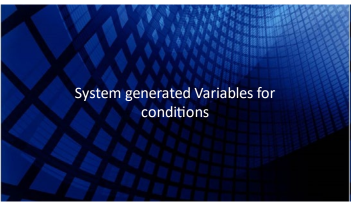
Syntax and Functions



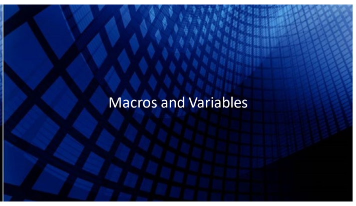
Enabling and validation conditions



Conditions in Rosters



System generated Variables for conditions



Macros and Variables

Presentations are available in electronic format in the archive provided with the Report.

2. Presentations for advanced users' workshop (cover-pages)

Survey Solutions: Overview

Oleksandr Krivtsov, Sergiy Radyakin
February, 2020

Combobox

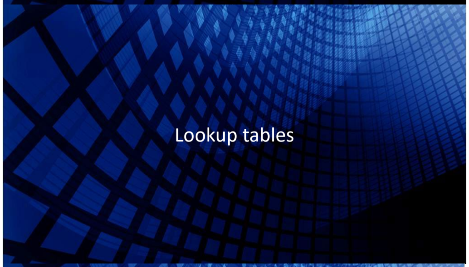
Classifications

Testing scenarios

Syntax and Functions

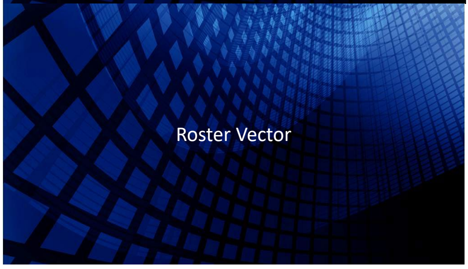
Dealing with exceptions

LINQ Expressions



Lookup tables

Random selection



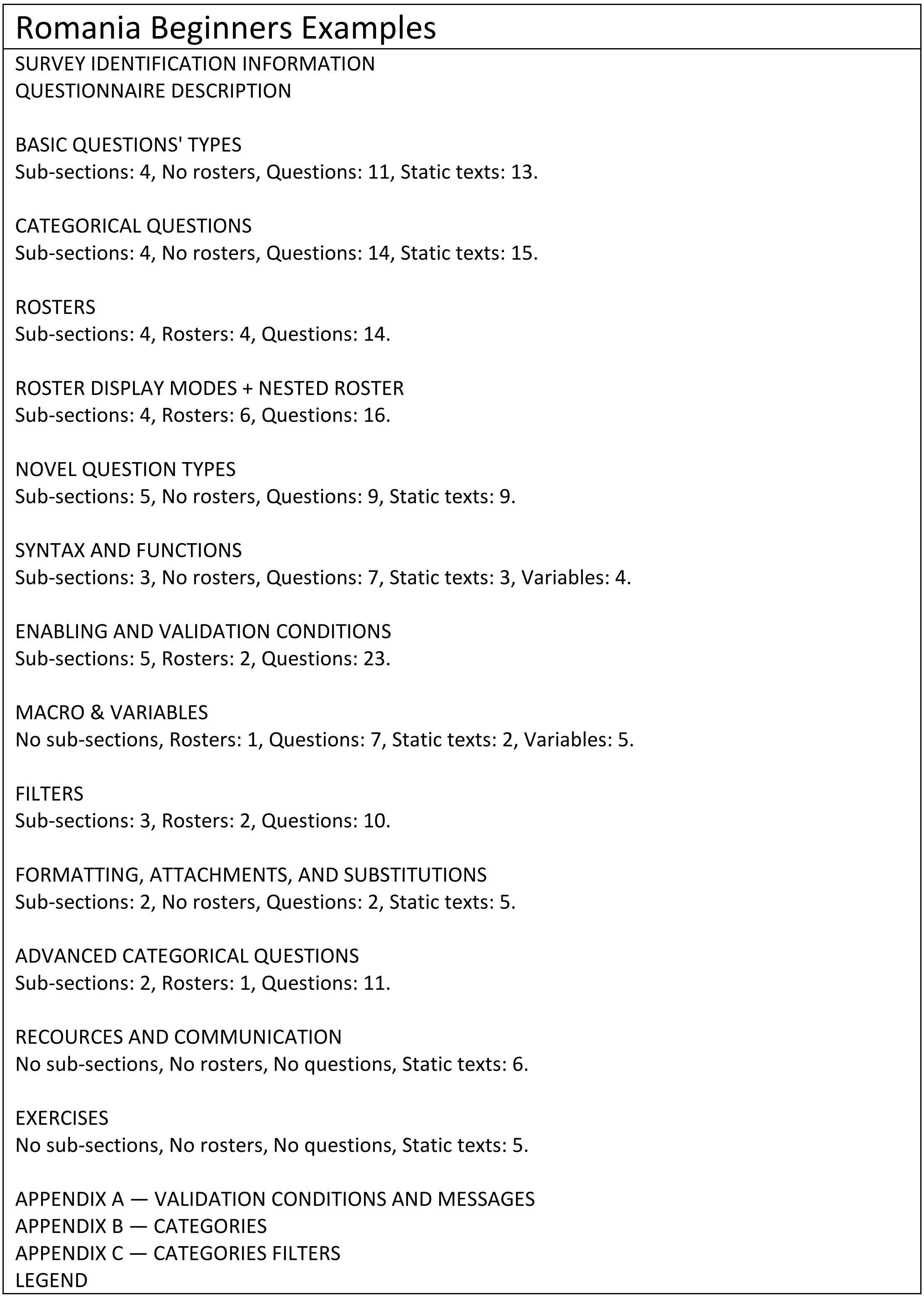
Roster Vector

Computer Assisted Web
Interviewing (CAWI)

Presentations are available in electronic format in the archive provided with the Report.

Annex 3 – Questionnaire practice

1. Questionnaire practice for beginner users’ workshop (excerpt)



Romania Beginners Examples

SURVEY IDENTIFICATION INFORMATION
QUESTIONNAIRE DESCRIPTION

BASIC QUESTIONS' TYPES
Sub-sections: 4, No rosters, Questions: 11, Static texts: 13.

CATEGORICAL QUESTIONS
Sub-sections: 4, No rosters, Questions: 14, Static texts: 15.

ROSTERS
Sub-sections: 4, Rosters: 4, Questions: 14.

ROSTER DISPLAY MODES + NESTED ROSTER
Sub-sections: 4, Rosters: 6, Questions: 16.

NOVEL QUESTION TYPES
Sub-sections: 5, No rosters, Questions: 9, Static texts: 9.

SYNTAX AND FUNCTIONS
Sub-sections: 3, No rosters, Questions: 7, Static texts: 3, Variables: 4.

ENABLING AND VALIDATION CONDITIONS
Sub-sections: 5, Rosters: 2, Questions: 23.

MACRO & VARIABLES
No sub-sections, Rosters: 1, Questions: 7, Static texts: 2, Variables: 5.

FILTERS
Sub-sections: 3, Rosters: 2, Questions: 10.

FORMATTING, ATTACHMENTS, AND SUBSTITUTIONS
Sub-sections: 2, No rosters, Questions: 2, Static texts: 5.

ADVANCED CATEGORICAL QUESTIONS
Sub-sections: 2, Rosters: 1, Questions: 11.

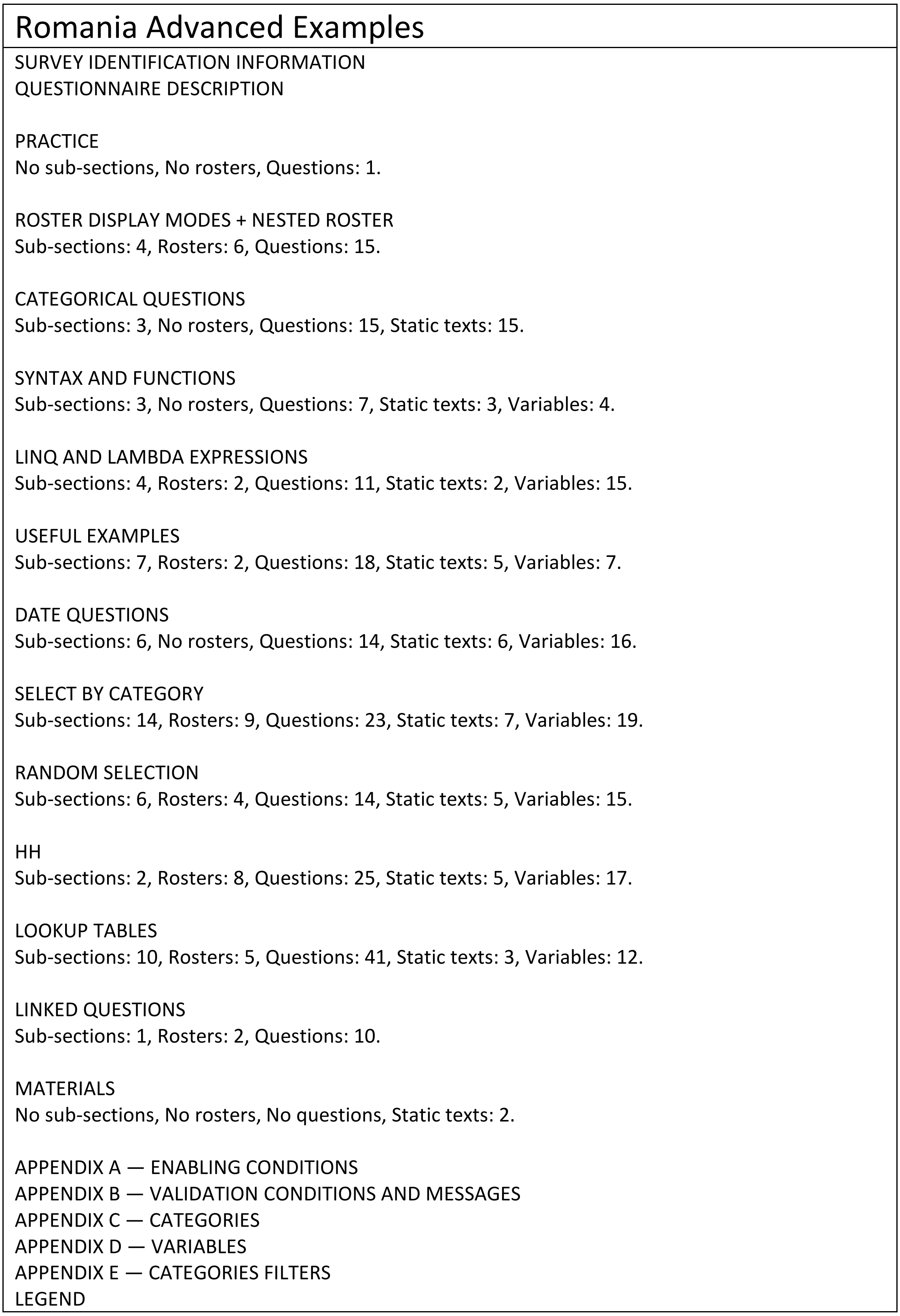
RECOURCES AND COMMUNICATION
No sub-sections, No rosters, No questions, Static texts: 6.

EXERCISES
No sub-sections, No rosters, No questions, Static texts: 5.

APPENDIX A — VALIDATION CONDITIONS AND MESSAGES
APPENDIX B — CATEGORIES
APPENDIX C — CATEGORIES FILTERS
LEGEND

The Questionnaire in full is available in electronic format in the archive provided with the Report.

2. Questionnaire practice for advanced users' workshop



Romania Advanced Examples

SURVEY IDENTIFICATION INFORMATION
QUESTIONNAIRE DESCRIPTION

PRACTICE
No sub-sections, No rosters, Questions: 1.

ROSTER DISPLAY MODES + NESTED ROSTER
Sub-sections: 4, Rosters: 6, Questions: 15.

CATEGORICAL QUESTIONS
Sub-sections: 3, No rosters, Questions: 15, Static texts: 15.

SYNTAX AND FUNCTIONS
Sub-sections: 3, No rosters, Questions: 7, Static texts: 3, Variables: 4.

LINQ AND LAMBDA EXPRESSIONS
Sub-sections: 4, Rosters: 2, Questions: 11, Static texts: 2, Variables: 15.

USEFUL EXAMPLES
Sub-sections: 7, Rosters: 2, Questions: 18, Static texts: 5, Variables: 7.

DATE QUESTIONS
Sub-sections: 6, No rosters, Questions: 14, Static texts: 6, Variables: 16.

SELECT BY CATEGORY
Sub-sections: 14, Rosters: 9, Questions: 23, Static texts: 7, Variables: 19.

RANDOM SELECTION
Sub-sections: 6, Rosters: 4, Questions: 14, Static texts: 5, Variables: 15.

HH
Sub-sections: 2, Rosters: 8, Questions: 25, Static texts: 5, Variables: 17.

LOOKUP TABLES
Sub-sections: 10, Rosters: 5, Questions: 41, Static texts: 3, Variables: 12.

LINKED QUESTIONS
Sub-sections: 1, Rosters: 2, Questions: 10.

MATERIALS
No sub-sections, No rosters, No questions, Static texts: 2.

APPENDIX A — ENABLING CONDITIONS
APPENDIX B — VALIDATION CONDITIONS AND MESSAGES
APPENDIX C — CATEGORIES
APPENDIX D — VARIABLES
APPENDIX E — CATEGORIES FILTERS
LEGEND

The Questionnaire in full is available in electronic format in the archive provided with the Report.

3. The R. script for automatic approval of the completed questionnaires through the API method.

The R. script for the automatic approval of the questionnaires completed by the API method (automate_approvals.R) is available in the archive with the materials of the workshops.

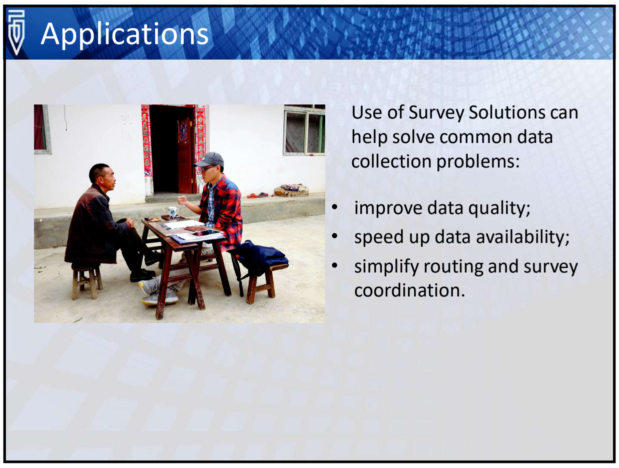
automate_approvals.R

Survey Solutions: Overview

Oleksandr Krivtsov, Sergiy Radyakin
February, 2020

Survey solutions

Survey Solutions is a free software for data collection and survey management developed in the Data group of The World Bank.



Applications

Use of Survey Solutions can help solve common data collection problems:

- improve data quality;
- speed up data availability;
- simplify routing and survey coordination.

Applications

Survey Solutions provides rich functionality for planning, design and implementation of surveys and is suitable for surveys of all types:

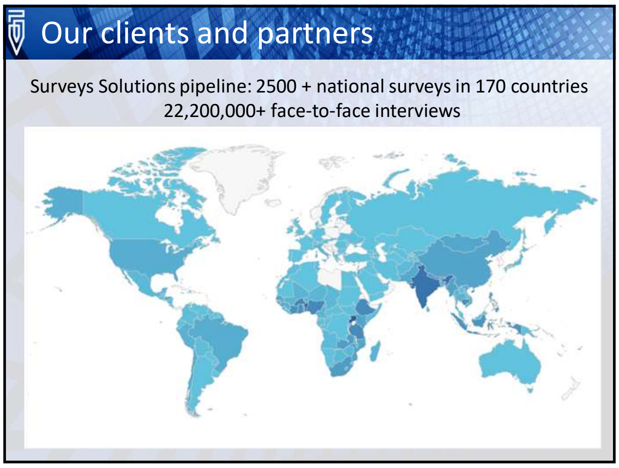
✓household income and budget surveys,

✓labor force surveys,

✓agricultural surveys,

✓health surveys,

✓enterprise surveys, etc.



Our clients and partners

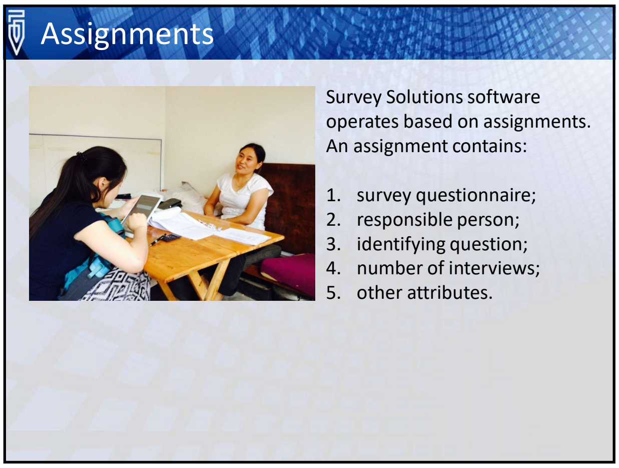
Surveys Solutions pipeline: 2500 + national surveys in 170 countries
22,200,000+ face-to-face interviews

Our clients and partners

Our clients and partners are National Statistical Offices, NGOs, Universities, Think Tanks, Private firms and e.c..

Components and Roles

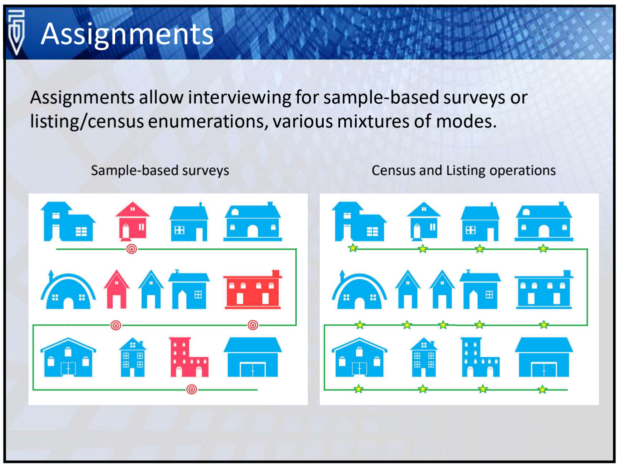
- ✓ Designer;
- ✓ Tester;
- ✓ Headquarter;
- ✓ Interviewer;
- ✓ Supervisor;
- ✓ Administrator;
- ✓ Observer.



Assignments

Survey Solutions software operates based on assignments. An assignment contains:

1. survey questionnaire;
2. responsible person;
3. identifying question;
4. number of interviews;
5. other attributes.

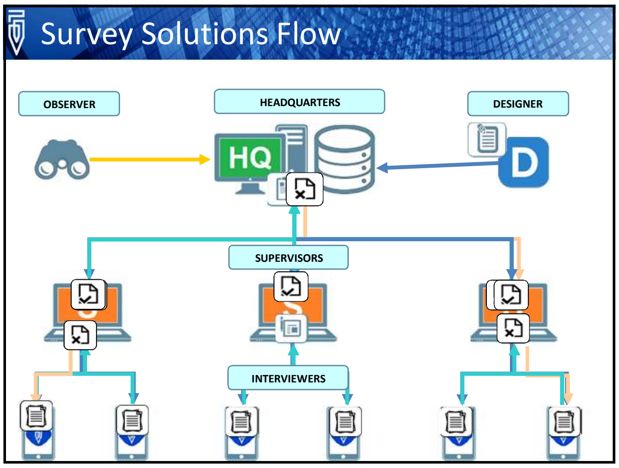


Assignments

Assignments allow interviewing for sample-based surveys or listing/census enumerations, various mixtures of modes.

Sample-based surveys

Census and Listing operations



Survey Solutions Flow

OBSERVER

HEADQUARTERS

DESIGNER

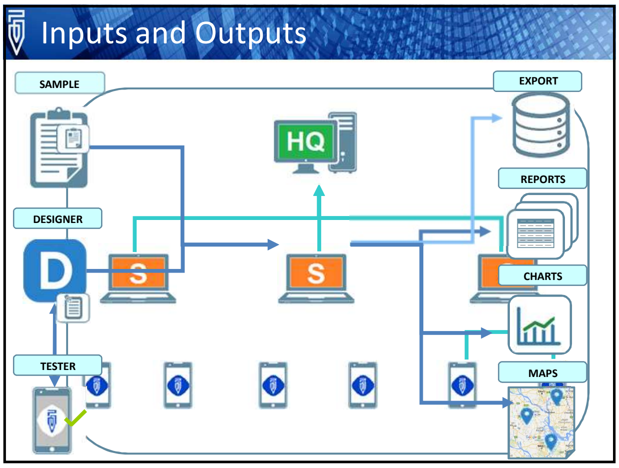
HQ

D

SUPERVISORS

S

INTERVIEWERS



Inputs and Outputs

SAMPLE

EXPORT

HQ

REPORTS

DESIGNER

D

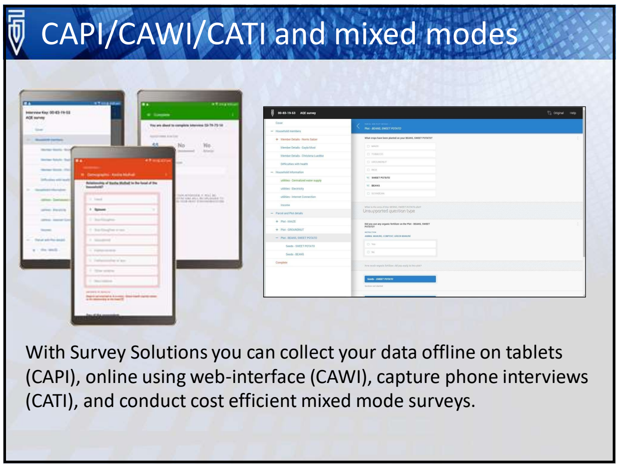
S

S

CHARTS

TESTER

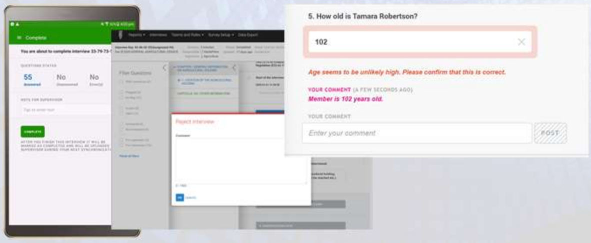
MAPS



CAPI/CAWI/CATI and mixed modes

With Survey Solutions you can collect your data offline on tablets (CAPI), online using web-interface (CAWI), capture phone interviews (CATI), and conduct cost efficient mixed mode surveys.

Commentaries



5. How old is Tamara Robertson?

102

Age seems to be unlikely high. Please confirm that this is correct.

YOUR COMMENT (A FEW SECONDS AGO)

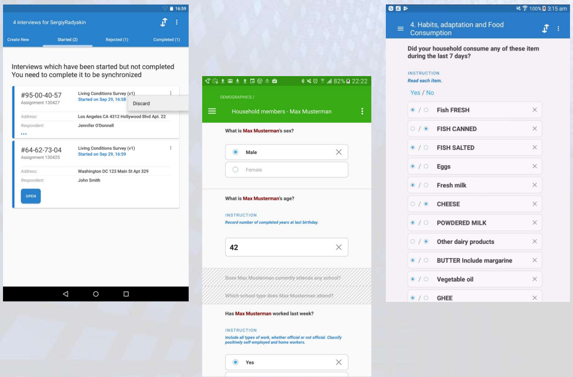
Member is 102 years old.

YOUR COMMENT

Enter your comment

- Throughout the data collection, interviewers and supervisors can use the rich commenting features to exchange notes and requests about the data being collected, and Survey Solutions keeps track of all such communication for audit, training, and quality assurance.
- Commentaries may be question-specific or questionnaire-specific.
- Exported with data, available for analysis after the survey.

Intuitive User Interface



4 interviews for SergiyRadyakin

Interviews which have been started but not completed
You need to complete it to be synchronized

Household members - Max Musterman

What is Max Musterman's sex?

○ Male
○ Female

What is Max Musterman's age?

42

Has Max Musterman worked last week?

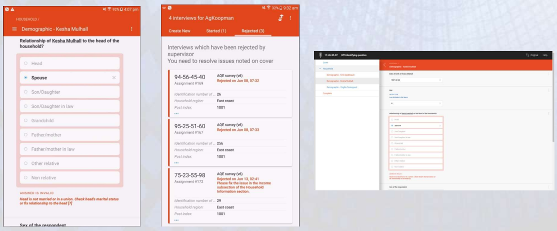
○ Yes

4. Habits, adaptation and Food Consumption

Did your household consume any of these item during the last 7 days?

Fish FRESH
FISH CANNED
FISH SALTED
Eggs
Fresh milk
CHEESE
POWDERED MILK
Other dairy products
BUTTER Include margarine
Vegetable oil
GHEE

Control quality of your data



Survey Solutions allows you to validate your answers and direct the interview flow; use macros, calculated variables and lookup tables to construct sophisticated data validation algorithms.

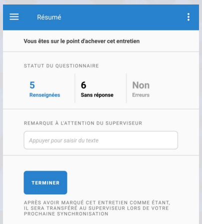
Connectivity

Internet connection is not required during the interview in CAPI mode in the household.

Survey Solutions allows interviewing to be done offline, and the data is synchronized to the remote server when the connection becomes available.

Global Solutions

Writing questions text, options, instructions, error messages in any language/script included in Unicode.



Résumé

Vous êtes sur le point d'achever cet entretien

STATUT DU QUESTIONNAIRE

5 Renseignées | 6 Sans réponse | Non Erreurs

REMARQUE À L'ATTENTION DU SUPERVISEUR

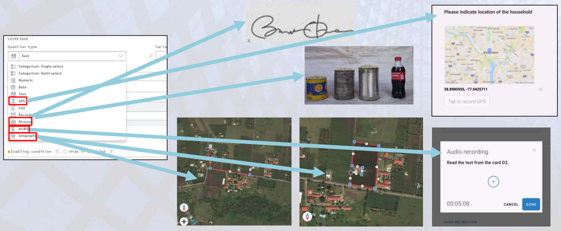
Appuyer pour saisir du texte

TERMINER

APRÈS AVOIR MARQUÉ CET ENTRETIEN COMME ÉTANT, IL SERA TRANSFÉRÉ AU SUPERVISEUR LORS DE VOTRE PROCHAINE SYNCHRONISATION

Multiple translations can be prepared by the designer for the same questionnaire, interviewers and supervisors can then switch between them at will.

Capture any type of data with ease


Please indicate location of the household
Audio recording
Read the text from the card D2.
00:05:08
CANCEL
DONE

With Survey Solutions you can design your surveys with a full range of standard and novel questions, utilize nested rosters and answer piping, cascading and linked questions and record information from external sensors.

Novel Question Types

- Novel question types allow capturing information that goes beyond pen and paper, and let the interviewers capture:
  - ✓ Location of the interview;
  - ✓ Map based area estimation;
  - ✓ Audio recording;
  - ✓ Images (of a house, person, document, product and e.c.);
  - ✓ Scan barcodes of various types;

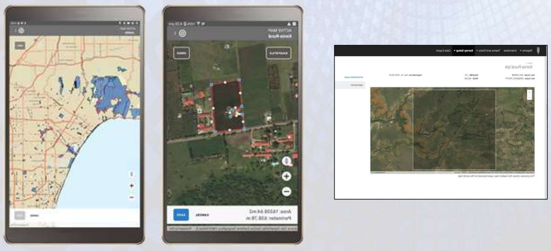
https://mysurvey.solutions

- Cascading selections narrow down the choices for the interviewer;
- Linked questions surve the information captured already in different part of the questionnaire: for example \who is the biological mother of John Smith?", \Who makes decisions on large purchases?"

Rosters

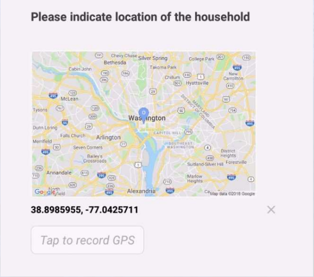
- Questions replication with rosters allow repetition of same questions to each household member or company employee.
- And the validation logic and skips will be automatically replicated too.
- Four types of rosters: fixed, or dynamic, triggered by numeric, multiple choice, or list questions.
- Rosters allow data collection in multiple levels of hierarchy, especially important for agricultural surveys with questions on multiple plots and crops. They can be implemented with nested rosters available in Survey Solutions!

GIS



With SuSo you can collect detailed GIS information on locations, distances, and areas, apply geofencing and guide interviewers to the point of interview offline using high resolution satellite images and built-in GPS receivers.

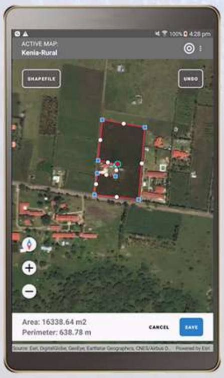
Connectivity GPS


Please indicate location of the household

38.8985955, -77.0425711

Internet connection is not required for recording location of the households with GPS.

Offline maps



Area: 16338.64 m2
Perimeter: 638.78 m

Open Data and Useful Metadata

✓Survey Solutions exports data in tab-delimited data format, which is understood by virtually any major statistical package, spreadsheet or database management application.

✓Data can also be exported for use with Stata and SPSS statistical packages in their native binary formats.

✓Data preloading and creation of assignments in an automatic mode allow facilitation of large surveys and especially panel surveys with ease.

Paradata

✓logging information on interview status changes;
✓logging individual changes to the interview with timestamps
✓ supplement with the GPS location data to discover unusual patterns in enumerators work.

With this information:

✓assess performance of the interviewers;
✓estimate completion of survey;
✓plan field operations and teams;
✓creation of custom reports.

Secure and scalable

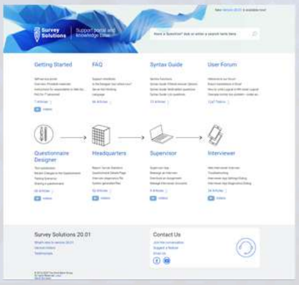
You can run your surveys on highly secure, scalable and free World Bank Cloud or deploy Survey Solutions on your own servers to fully control who and how could access your data.

✓No matter where the server is, Survey Solutions defends your data from unauthorized access and makes data and reports available only to authorized users. As a server administrator you can decide who is performing which role, and the scope of accessible information.

✓Instant data downloads and scheduled backups assure condence in safety and preservation of the collected data.

Supported

Survey Solutions is supported by a team of experts located in different time zones making advising faster and more responsive.



https://support.mysurvey.solutions/

More info

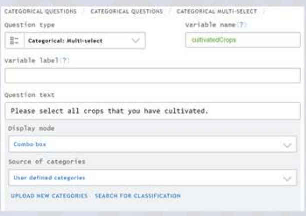
Everyone is welcomed to try Survey Solutions!

- The documentation for the software:
  http://support.mysurvey.solutions
- User forum:
  http://forum.mysurvey.solutions
- The web-based survey designer tool at:
  http://designer.mysurvey.solutions
- "Survey Solutions Tester" app at Google (TM) Play
- Check for yourself how you can capture and accumulate the data using our 24/7-available demo server:
  https://demo.mysurvey.solutions
- When ready, request and manage your dedicated Survey Solutions server:
  https://mysurvey.solutions

Combobox

Multi-select: Combo box

- The typical use of this kind of question is most suitable for, e.g. agricultural surveys, where question like *"What crops do you grow on this plot?"* are common, and simply a large number of possible option categories
- The number of positive selections is still limited up to 200


CATEGORICAL QUESTIONS / CATEGORICAL QUESTIONS / CATEGORICAL MULTI-SELECT

Question type: Categorical: Multi-select

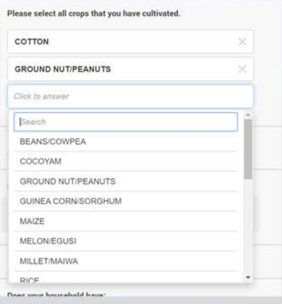
Variable name: cultivatedCrops

Variable label

Question text: Please select all crops that you have cultivated.

Display mode: Combo box

Source of categories: User defined categories

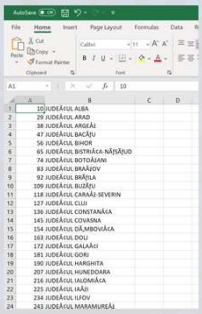

Please select all crops that you have cultivated.

COTTON

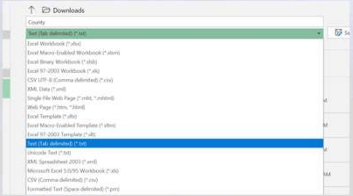
GROUND NUT/PEANUTS

How to createe a Combo box file

To create an auto complete question:
Prepare a file of choices: tab delimited file with two columns numeric code and text label.



	A	B	C	D
1	10	JUDEÅ¢UL ALBA		
2	29	JUDEÅ¢UL ARAD		
3	38	JUDEÅ¢UL ARGEÅž		
4	47	JUDEÅ¢UL BACÄƒU		
5	56	JUDEÅ¢UL BIHOR		
6	65	JUDEÅ¢UL BISTRIÅ¢A-NÄƒSÄƒUD		
7	74	JUDEÅ¢UL BOTOÅžANI		
8	83	JUDEÅ¢UL BRAÅžOV		
9	92	JUDEÅ¢UL BRÄƒILA		
10	109	JUDEÅ¢UL BUZÄƒU		
11	118	JUDEÅ¢UL CARAÅž-SEVERIN		
12	127	JUDEÅ¢UL CLUJ		
13	136	JUDEÅ¢UL CONSTANÅ¢A		
14	145	JUDEÅ¢UL COVASNA		
15	154	JUDEÅ¢UL DÄ‚MBOVIÅ¢A		
16	163	JUDEÅ¢UL DOLJ		
17	172	JUDEÅ¢UL GALAÅ¢I		
18	181	JUDEÅ¢UL GORJ		
19	190	JUDEÅ¢UL HARGHITA		
20	207	JUDEÅ¢UL HUNEDOARA		
21	216	JUDEÅ¢UL IALOMIÅ¢A		
22	225	JUDEÅ¢UL IAÅžI		
23	234	JUDEÅ¢UL ILFOV		
24	243	JUDEÅ¢UL MARAMUREÅž		

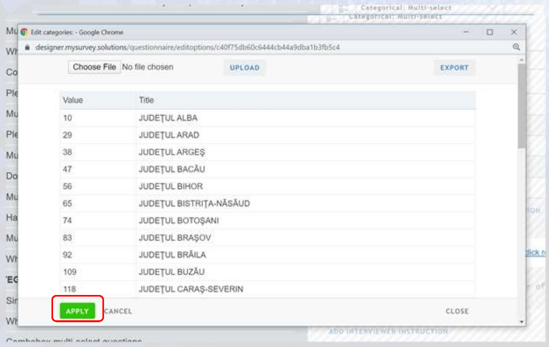

Downloads

County

Text (Tab delimited) (*.txt)

Excel Workbook (*.xlsx)
Excel Macro-Enabled Workbook (*.xlsm)
Excel Binary Workbook (*.xlsb)
Excel 97-2003 Workbook (*.xls)
CSV UTF-8 (Comma delimited) (*.csv)
XML Data (*.xml)
Single File Web Page (*.mht, *.mhtml)
Web Page (*.htm, *.html)
Excel Template (*.xltx)
Excel Macro-Enabled Template (*.xltm)
Excel 97-2003 Template (*.xlt)
Text (Tab delimited) (*.txt)
Unicode Text (*.txt)
XML Spreadsheet 2003 (*.xml)
Microsoft Excel 5.0/95 Workbook (*.xls)
CSV (Comma delimited) (*.csv)
Formatted Text (Space delimited) (*.prn)

How to upload a Combo box file


Edit categories: - Google Chrome

designer.mysurvey.solutions/questionnaire/editoptions/c40f75db60c6444cb44a9dba1b3fb5c4

Choose File No file chosen

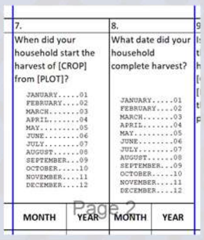
Value	Title
10	JUDEȚUL ALBA
29	JUDEȚUL ARAD
38	JUDEȚUL ARGEŞ
47	JUDEȚUL BACĂU
56	JUDEȚUL BIHOR
65	JUDEȚUL BISTRIȚA-NĂSĂUD
74	JUDEȚUL BOTOŞANI
83	JUDEȚUL BRAŞOV
92	JUDEȚUL BRĂILA
109	JUDEȚUL BUZĂU
118	JUDEȚUL CARAŞ-SEVERIN

Combo box

LIVE DEMO: how to create combo box file

Reusable categories

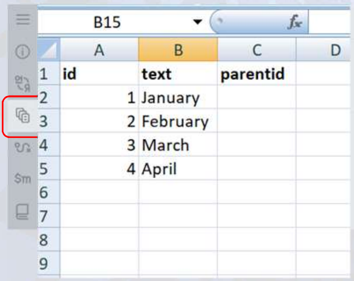
A questionnaire designer may define a set of categories and use them multiple times across the questionnaire in different single-select and multi-select questions. For example, the same list of all countries in the world could be reused for questions *"Which countries have you visited?"*, *"Which country did you visit last?"*, *"Which country do you plan to go next?"*.



7.		8.	
When did your household start the harvest of [CROP] from [PLOT]? JANUARY.....01 FEBRUARY....02 MARCH.......03 APRIL.......04 MAY.........05 JUNE........06 JULY........07 AUGUST......08 SEPTEMBER...09 OCTOBER.....10 NOVEMBER....11 DECEMBER....12		What date did your household complete harvest? JANUARY.....01 FEBRUARY....02 MARCH.......03 APRIL.......04 MAY.........05 JUNE........06 JULY........07 AUGUST......08 SEPTEMBER...09 OCTOBER.....10 NOVEMBER....11 DECEMBER....12	
MONTH	YEAR	MONTH	YEAR

There are numerous advantages of this approach:
✓Categories are defined once, subsequent reuse is faster for the designer;
✓Any changes in the list immediately affect all questions where these categories are used;
✓The questionnaire becomes more compact (in terms of its size);
✓There is less work for the translator as the translation needs to be supplied only once.

Reusable categories: Step 1

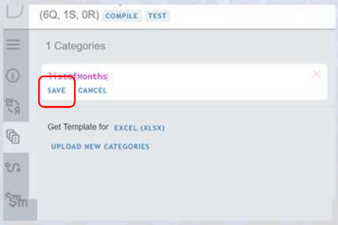


	A	B	C	D
1	id	text	parentid	
2	1	January		
3	2	February		
4	3	March		
5	4	April		
6				
7				
8				
9				

To create a categories file:

1. Click the Categories icon located on advanced panel.
2. Download the template.
3. Add your categories to the file.
   1. ID – value(code) of an option;
   2. Text – Title(text) of an option;
   3. ParentId – used for cascading combo box mode.
4. Safe file as tab delimited.

Reusable categories: Step 2



listOfMonths

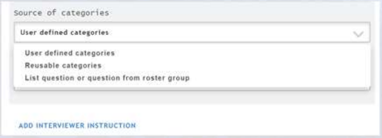
After you created tab file with categories:

1. Click Upload New Categories button.
2. Specify the name of collection and press the Save button

Reusable categories: Step 3

To add a Collection of categories to a categorical question:

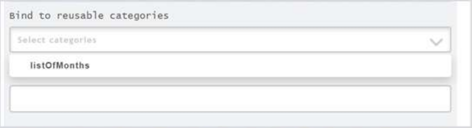
1. Open a question properties;
2. Select source of categories “Reusable categories”;



Source of categories: User defined categories

User defined categories
Reusable categories
List question or question from roster group
ADD INTERVIEWER INSTRUCTION

3. Select a Collection.



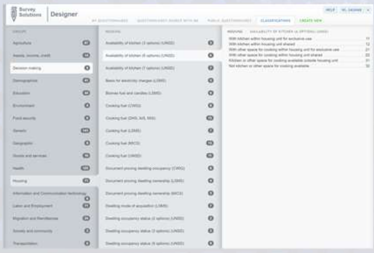
Reusable categories

LIVE DEMO: reusable categories

Classifications

Classifications

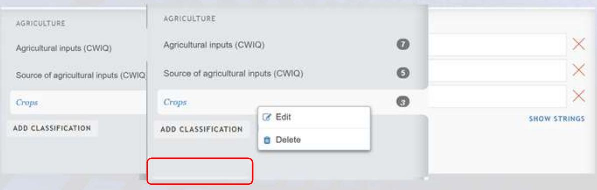
The classification library allows users to draw from a library of public and/or private classifications (answer options). More than a convenience feature, the classification library aids with standardization of classifications–that is, alignment with intenational best practices and/or consistency with internal practices.



How to create a Classifications

You can create a private classification:

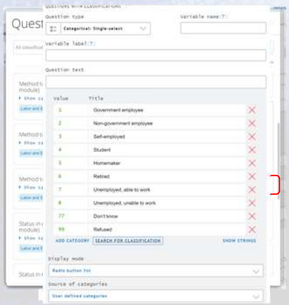
1. Click on the Add classification button and specify the name of the classification and save it.
2. Click on the name of your classification and add list of categories.
3. To Edit/delete a classification name right click on the classification name and select your action.


AGRICULTURE
Agricultural inputs (CWIQ)
Source of agricultural inputs (CWIQ
Crops
ADD CLASSIFICATION
AGRICULTURE
Agricultural inputs (CWIQ)
7
Source of agricultural inputs (CWIQ)
5
Crops
3
Edit
Delete
ADD CLASSIFICATION
SHOW STRINGS

Add a classification to a questionnaire

Classification could be added to most Categorical questions.
To do that:

1. Create a categorical question;
2. Press Search for Classification button;
3. Click on the drop-down menu, optionally, to restrict search to the selected question bank folder.
4. Enter text in the Search for a question field in order to search for questions that contain that text.
5. Click on the question text in order to open up the question in the source questionnaire. In this way, the user can see question in its original context, see the question's full attributes, etc.
6. Click on ADD button to add categories to your question.



Value	Title
1	Government employee
2	Non-government employee
3	Self-employed
4	Student
5	Homemaker
6	Retired
7	Unemployed, able to work
8	Unemployed, unable to work
77	Don't know
99	Refused

Current limitations

Currently, users cannot:

- Create private groups
- Share private classifications with a user-defined set of other users
- Publish private classifications for all users to access
- Upload "large" classifications via copy-paste. This is a browser limitation rather than a limitation of Desig
- Upload classifications, large or small, via file upload.

Testing scenarios

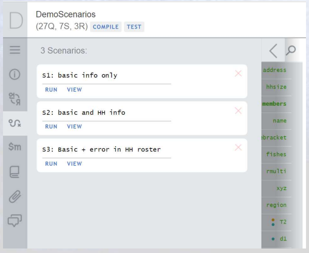
Testing Scenarios

Survey Solutions scenarios represent a storage of responses provided during a testing session.

The objective is **not** to collect the data (use Interviewer App for that), but to simplify testing of complex questionnaires which require a certain time-consuming input.

Two actions are available for a scenario in the Designer:

- **view:** review the answers entered in the scenario;
- **run:** start testing and apply the scenario to the questionnaire.


DemoScenarios
(27Q, 7S, 3R) COMPILE TEST

3 Scenarios:

S1: basic info only
RUN VIEW

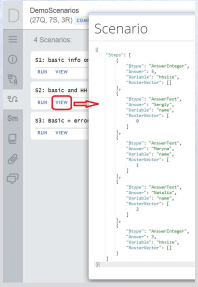
S2: basic and HH info
RUN VIEW

S3: Basic + error in HH roster
RUN VIEW

Testing Scenarios

Here is what you need to know about scenarios:

- There can be multiple scenarios for the same questionnaire.
- A scenario doesn't have to cover all.
- A scenario may become **no longer applicable**.
- Scenarios are **not copied** when you copy a section or the whole questionnaire into another questionnaire.
- To edit a scenario, you need to run it first, then make any changes interactively in the WebTester, then save under the same or a different scenario name.
- One **may not** edit scenario steps directly, only view.
- Saving a scenario requires **edit permission** for accessing the questionnaire.
- Creation and changes to scenarios are **not** reflected in the questionnaire history.
- A scenario saves all the steps, how the answers were applied to the questionnaire, not just the resulting final state! This is obvious from the recording of the scenario steps:


DemoScenarios
(27Q, 7S, 3R) COM

4 Scenarios:

S1: basic info or
RUN VIEW

S2: basic and HH
RUN VIEW

S3: Basic + error
RUN VIEW

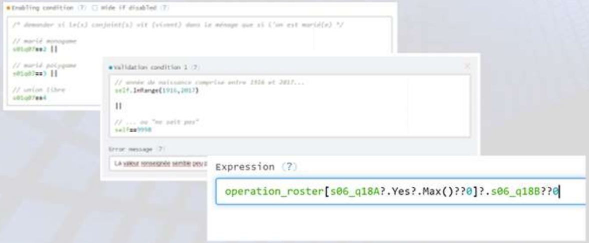
Scenario

```
{
    "Steps": [
        {
            "$type": "AnswerInteger",
            "Answer": 5,
            "Variable": "hhsize",
            "RosterVector": []
        },
        {
            "$type": "AnswerText",
            "Answer": "Sergiy",
            "Variable": "name",
            "RosterVector": [
                0
            ]
        },
        {
            "$type": "AnswerText",
            "Answer": "Maryna",
            "Variable": "name",
            "RosterVector": [
                1
            ]
        },
        {
            "$type": "AnswerText",
            "Answer": "Natalia",
            "Variable": "name",
            "RosterVector": [
                2
            ]
        },
        {
            "$type": "AnswerInteger",
            "Answer": 3,
            "Variable": "hhsize",
            "RosterVector": []
        }
    ]
}
```

Syntax and Functions

Expressions

Expressions are utilized in Survey Solutions in:
✓enabling conditions;
✓validation conditions;
✓filtering conditions;
✓calculated variables' expressions;



Enabling condition (?) ☐ Hide if disabled (?)

```
/* demander si le(s) conjoint(s) vit (vivent) dans le ménage que si l'on est marié(e) */

// marié monogame
s01q07==2 ||

// marié polygame
s01q07==3 ||

// union libre
s01q07==4
```

Validation condition 1 (?)

```
// année de naissance comprise entre 1916 et 2017...
self.InRange(1916,2017)

||

// ... ou "ne sait pas"
self==9998
```

Error message (?)

LA valeur renseignée semble peu

Expression (?)

```
operation_roster[s06_q18A?.Yes?.Max()??0]?.s06_q18B??0
```

Expressions

Writing expressions is different from programming. You don't have to be a programmer to work with Survey Solutions, but there are several simple things every designer needs to know:

- ➢expressions are written in C#;
- ➢C# is a case-sensitive language;
- ➢To refer to the answer of a question, specify the variable name corresponding to that question, like so: age
- ➢To compare strings, enclose string constants in quotes, like so: city=="New York";
- ➢expressions should be free of syntax errors;
- ➢expressions have types.

Expressions

Each expression has a type as per C# reference or Survey Solutions definition. C# language has hundreds of types and allows other composite types to be derived from base types.

In Survey Solutions expressions for **enabling conditions**, validation conditions, and filtering conditions are of Boolean type: Boolean type means only two values are possible: **true** and **false**;

- ➢A question is enabled if the enabling condition is blank or evaluates to true;
- ➢Answer to a question is considered to be valid if the validation condition is blank or evaluates to true;
- ➢An option is included in a categorical question if a filter is blank or evaluates to true.

Data types

Common types used to define calculatable variables are

- ➢**bool?** – Boolean nullable – for logical expressions;
- ➢**long?** – Long nullable – for storing integer values;
- ➢**double?** – Double nullable – for storing fractional values;
- ➢**string** – for storing strings (text);
- ➢**DateTime?** – Date/Time nullable – for storing timestamps with properties: Year, Month, Day, Hour, Minute, Second, and others;

In C# a question mark following the type signifies the type which is nullable, meaning null is a possible value;

Typical use of nullable value type is when needed to represent the undefined value of an underlying value type. For example, a Boolean, or **bool**, variable can only be either true or false. However, in some cases a variable value can be undefined or missing. For example, a database field may contain true or false, or it may contain no value at all, that is, **NULL**. The **bool?** type is used in those scenarios.

Nullable types

Nullable - Each instance of a nullable type has two public read-only properties:

- ➢**HasValue**. HasValue indicates whether an instance of a nullable value type has a value of its underlying type. It is set to *true* when the variable contains a non-null value;
- ➢**Value**. Value is of the same type as the underlying type. If HasValue is true, Value contains a meaningful value.

In Survey Solutions value of **null** is used to indicate a question has not been answered yet.

Survey solutions defined types

GPS question type is defined customly in Survey Solutions:

```
class GeoLocation {
        double Latitude;
        double Longitude;
        double Accuracy;
        double Altitude;
}
```

One can construct a new object of class GeoLocation with the following constructor:

new GeoLocation(lat, long, acc, alt)

Survey solutions defined types

Live Demo: construction of GPS and its use

Survey solutions defined types

Geography question type is defined customly in Survey Solutions:

```
class Geography {
        double Area;
        double Length;
        int PointsCount;
}
```

Check these and other types online: type “data types” in the search box on the support site.

Survey solutions defined types

Text list question type is defined customly in Survey Solutions:

```
TextListAnswerRow[];  // any list question is an array of :

class TextListAnswerRow{
                int Value;
                string Text;
}
```

One can access the items in the list by refering through indexing, refering to code with **.Value** what represent a code which was automatically assigned to each row by Survey Solutions, and **.Text** that was entered by the user.

.Value will be used as @rostercode for roster triggered list rosters.

Live Demo: list

Arithmetic Operators

The following table shows the arithmetic operators supported by Survey Solutions. Arithmetic expressions are evaluated from left to right. For the example, ***assume A = 20 and B = 10***

Operator	Description	Example
+	Addition: returns the sum	`A + B` = 35
-	Subtraction: returns the difference	`A - B` = 10
*	Multiplication: returns the product	`A * B` = 200
/	Division: returns the quotient	`B / A` = 2
%	Modulus: returns the remainder after an integer division	`B % A` = 0 (The remainder of 20 divided by 10 is 0)

Relational Operators

These operators compare two values and return either **TRUE** or **FALSE.** The following comparison operators are supported by Survey Solutions:

Operator	Description	Example
==	Checks if the two values are *equal*. If values are equal, then the condition is true	`20 == 10` returns **FALSE**
!=	Checks if the two values are *not equal*. If the values are not equal, then the condition is false	`20 != 10` returns **TRUE**
>	Checks if the left value is *greater than* the right value	`20 > 10` returns **TRUE**
<	Checks if the left value is *less than* the right value	`20 < 10` returns **FALSE**
>=	Checks if the left value is *greater than or equal to* the right value	`20 >= 10` returns **TRUE**. `10 >= 10` returns **TRUE**.
<=	Checks if the left value is *less than or equal to* the right value	`20 <= 10` returns **FALSE**. `10 <= 10` returns **TRUE**.

Relational Operators

Warning!

❖Multi-categorical questions' value is a vector(an array), not a scalar (single value);

❖never use relational operators with MCQs;

❖instead use a function like: .Contains().

Logical operators

Logical values returns either **TRUE** or **FALSE**. The following tables show the logical operators supported by Survey Solutions:

Operator	Description	Example
&&	Logical AND operator. A && B returns true of *both* expression A and B are true.	`(20 == 10) && (10 > 5)` returns **FALSE** `(10 == 10) && (10 > 5)` returns **TRUE**
||	Logical OR operator A || B returns true if *either* expression A or expression B is true	`(20 == 10) || (10 > 5)` returns **TRUE** `(20 == 10) || (10 < 5)` returns **FALSE**
!	Logical NOT operator !A returns true if expression A is false. It returns false if expression A is true.	`!(20 == 10)` returns **TRUE** `!(10 == 10)` returns **FALSE**

Other Useful operators

These are other operators that you might want to use in your Survey Solutions instrument.

Operator	Description	Example
?:	Conditional Expression/ The condition must evaluate to true or false. If condition is true, the *first expression* is evaluated and becomes the result. If condition is false, the *second expression* is evaluated and becomes the result. Only one of the two expressions is evaluated.	`(10 < 2)? a:b` will return b `(10 > 2)? a:b` will return a

Functions

f(x)

In C#, a function is a way of packaging code that does something and then returns the value.

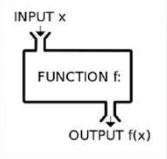
❖Functions are ready-made expression components that can be used by questionnaire designers for common tasks in validation and enabling conditions;

❖Designers don't have to use them or know all of them; they are shortcuts for common tasks, which in some cases can be done in standard C# (though commonly with longer expressions);

❖Functions allow performing tasks, which would be different to achieve by writing expressions.

Functions

❖Functions transform one kind of information into different, for example dates into number of years, or coordinates into kilometers;



❖Black box concept: most of the users don't care how the function is implemented;

❖Users do need to know the inputs and output of the function!

Functions

f(x)

❖Functions consist of function name and arguments in parentheses, here **f** is a function name, and **x** is one or more arguments (multiple arguments are separated by commas);

❖ Arguments can be questions from the questionnaire, constants.
For example: IsAnswered(variableName), InList(2,9,88).

❖Arguments have types;
For example: variableName.InRange(1900,2016), arguments could be only **long** or **double**.

❖Functions have types (type of result).
For example: variableName.InRange(1900,2016) result of this function is **bool** type

Types compatibility

❖Arguments must match function's requirements.
For example: FullYearsBetween(date, ~~string~~)

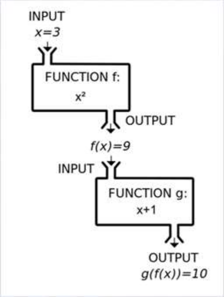
❖In some cases (e.g. constants) types can be converted by the C# automatically, e.g. if the argument must be double, but a long integer is specified.

❖If the argument is of incompatible type, the compilation error will be shown.

❖Explicit types conversion can be used in some cases: F((type)arg).

Functions

Functions have result types, which must be taken into account when the result of the function is used as an argument for another function.



Functions

❖Some functions can be called as extensions to questions (like methods):
variableName.Contains(5) this function checks whether the value ***5*** is among the answers to a **variableName** – that is, is contained in the set of answers.
Returns *true* if ***5*** is contained in **variableName**'s answers. Returns *false* otherwise.

❖Some functions can only be called as standalone:
IsDate(YearDate, MonthDate, DayDate) is *true* if the three specified arguments comprise a valid date.
Example: assume you have a series of 3 numeric questions asking for a household members date of birth, and you want check that the date recorded is a valid date.
The syntax for the validation condition would be:
IsDate(YearDate, MonthDate, DayDate)

Live Demo: IsDate()/new Date()

Functions' groups

❖Numeric: InRange(), InList();

❖String: Left(), Right(), ConsistsOf();

❖Lists: ContainsAll(), ContainsAny(), ContainsOnly(), etc;

❖Date and time management: CenturyMonthCode(), FullYearsBetween(), etc

❖Geolocation: GpsDistance(), GpsDistanceKm(), etc;

❖Other/Miscelleneous

Most functions require arguments, functions listed here are shown without arguments.

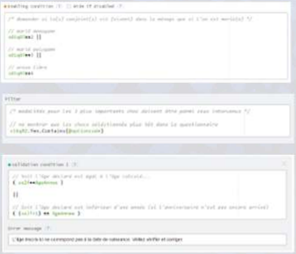
Functions: use

❖Some functions are conveniently of Boolean type: IsAnswered(), IsNumber(), ContainsAny(), etc, which allows them to be used in the expressions for enabling, filtering and validation;

❖Some functions are of other type, and must be used as part of a bigger expression, which must be of Boolean type, for example: poinB.GpsDistanceKm(pointA)<30

Summary

So what does the programming language do?



Enabling condition (?) ☐ Hide if disabled (?)

```
/* demander si le(s) conjoint(s) vit (vivent) dans le ménage que si l'on est marié(e) */

// marié monogame
[illegible] ||

// marié polygame
[illegible] ||

// union libre
[illegible]
```

Filter

```
/* modalités pour les 3 plus importants chocs doivent être parmi ceux intervenus */

// ne montrer que les chocs sélectionnés plus tôt dans le questionnaire
s16aQ2.Yes.Contains(@optioncode)
```

Validation condition 1 (?)

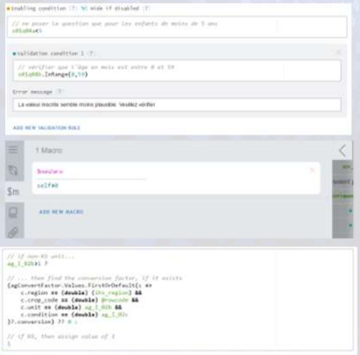
```
// Soit l'âge déclaré est égal à l'âge calculé...
( self==ageAnnee )

||

// Soit l'âge déclaré est inférieur d'une année (si l'anniversaire n'est pas encore arrivé)
( (self+1) == ageAnnee )
```

Error message (?)

L'âge inscrit ne correspond pas à la date de naissance. Veuillez vérifier et corriger

- Enables objects in the questionnaire
  - « Skip » sections, sub-sections, or non-relevant questions
  - Limit available answer options
- Evaluate answers
  - Internal consistency
  - Plausibility
- Accomplish intermediary tasks
  - Consult lookup tables
  - Define the value of variables

Summary



Enabling condition (?) ☑ Hide if disabled (?)

```
// ne poser la question que pour les enfants de moins de 5 ans
s01q04a<5
```

Validation condition 1 (?)

```
// vérifier que l'âge en mois est entre 0 et 59
s01q04b.InRange(0,59)
```

Error message (?)

La valeur inscrite semble moins plausible. Veuillez vérifier

ADD NEW VALIDATION RULE

1 Macro

```
$nonZero
self>0
```

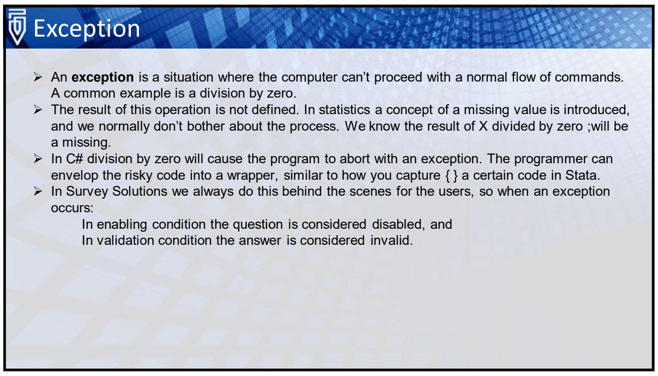
ADD NEW MACRO

```
// if non-KG unit...
ag_I_02b>1 ?

// ... then find the conversion factor, if it exists
(agConvertFactor.Values.FirstOrDefault(c =>
    c.region == (double) (ihs_region) &&
    c.crop_code == (double) @rowcode &&
    c.unit == (double) ag_I_02b &&
    c.condition == (double) ag_I_02c
)?.conversion) ?? 0 :

// if KG, then assign value of 1
1
```

Where to use it?

- Enablement conditions
  - Of questions
  - Of answer options
  - Of sections
  - Of static text
  - Of rosters
- Validation conditions
- Resources for these conditions
  - Macroses
  - Variables

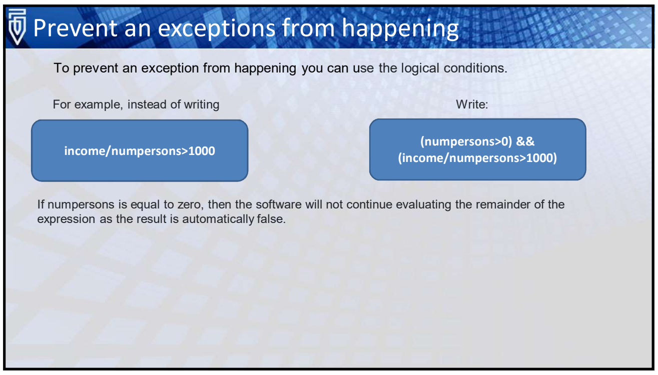
Dealing with exceptions



Exception

- An **exception** is a situation where the computer can't proceed with a normal flow of commands. A common example is a division by zero.
- The result of this operation is not defined. In statistics a concept of a missing value is introduced, and we normally don't bother about the process. We know the result of X divided by zero ;will be a missing.
- In C# division by zero will cause the program to abort with an exception. The programmer can envelop the risky code into a wrapper, similar to how you capture { } a certain code in Stata.
- In Survey Solutions we always do this behind the scenes for the users, so when an exception occurs:

    In enabling condition the question is considered disabled, and
    In validation condition the answer is considered invalid.



Prevent an exceptions from happening

To prevent an exception from happening you can use the logical conditions.

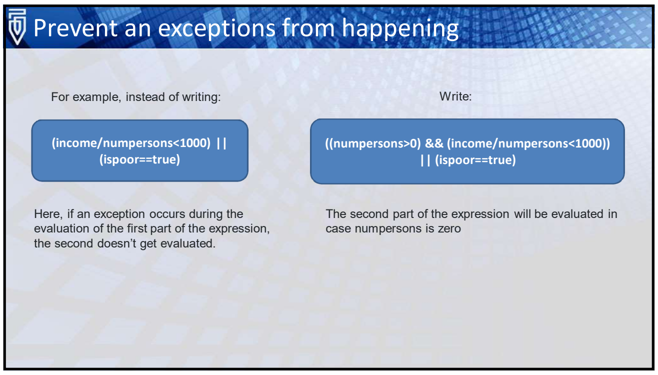
For example, instead of writing

income/numpersons>1000

Write:

(numpersons>0) &&
(income/numpersons>1000)

If numpersons is equal to zero, then the software will not continue evaluating the remainder of the expression as the result is automatically false.



Prevent an exceptions from happening

For example, instead of writing:

(income/numpersons<1000) ||
(ispoor==true)

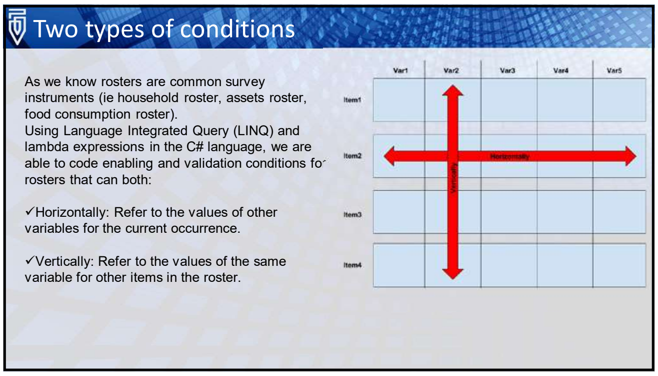
Here, if an exception occurs during the evaluation of the first part of the expression, the second doesn't get evaluated.

Write:

((numpersons>0) && (income/numpersons<1000))
|| (ispoor==true)

The second part of the expression will be evaluated in case numpersons is zero

LINQ Expressions

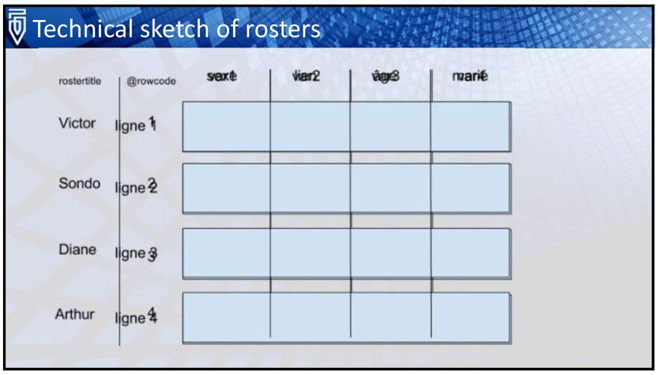


Two types of conditions

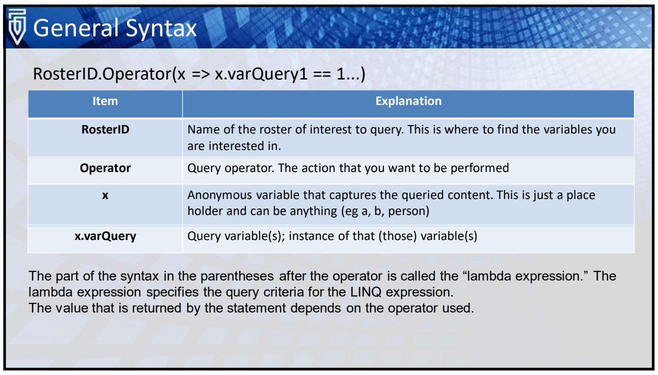
As we know rosters are common survey instruments (ie household roster, assets roster, food consumption roster).
Using Language Integrated Query (LINQ) and lambda expressions in the C# language, we are able to code enabling and validation conditions fo rosters that can both:

✓Horizontally: Refer to the values of other variables for the current occurrence.

✓Vertically: Refer to the values of the same variable for other items in the roster.



Technical sketch of rosters

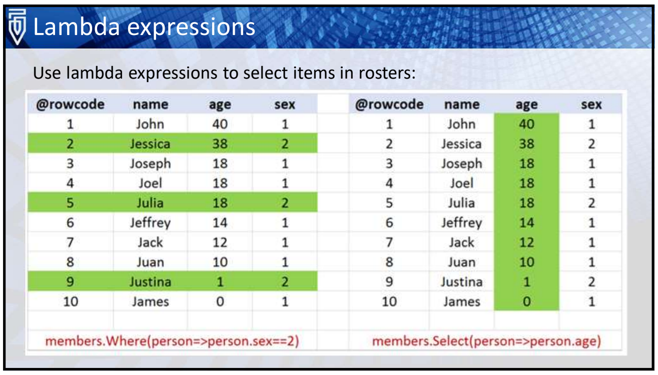


General Syntax

RosterID.Operator(x => x.varQuery1 == 1...)

Item	Explanation
RosterID	Name of the roster of interest to query. This is where to find the variables you are interested in.
Operator	Query operator. The action that you want to be performed
x	Anonymous variable that captures the queried content. This is just a place holder and can be anything (eg a, b, person)
x.varQuery	Query variable(s); instance of that (those) variable(s)

The part of the syntax in the parentheses after the operator is called the “lambda expression.” The lambda expression specifies the query criteria for the LINQ expression.
The value that is returned by the statement depends on the operator used.



Lambda expressions

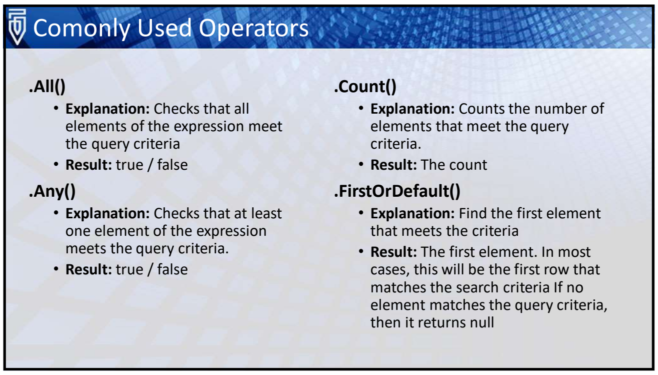
Use lambda expressions to select items in rosters:

@rowcode	name	age	sex
1	John	40	1
2	Jessica	38	2
3	Joseph	18	1
4	Joel	18	1
5	Julia	18	2
6	Jeffrey	14	1
7	Jack	12	1
8	Juan	10	1
9	Justina	1	2
10	James	0	1

members.Where(person=>person.sex==2)

@rowcode	name	age	sex
1	John	40	1
2	Jessica	38	2
3	Joseph	18	1
4	Joel	18	1
5	Julia	18	2
6	Jeffrey	14	1
7	Jack	12	1
8	Juan	10	1
9	Justina	1	2
10	James	0	1

members.Select(person=>person.age)



Comonly Used Operators

.All()

- **Explanation:** Checks that all elements of the expression meet the query criteria
- **Result:** true / false

.Any()

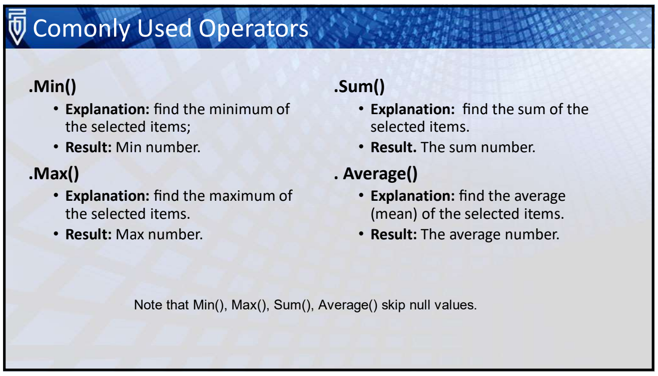
- **Explanation:** Checks that at least one element of the expression meets the query criteria.
- **Result:** true / false

.Count()

- **Explanation:** Counts the number of elements that meet the query criteria.
- **Result:** The count

.FirstOrDefault()

- **Explanation:** Find the first element that meets the criteria
- **Result:** The first element. In most cases, this will be the first row that matches the search criteria If no element matches the query criteria, then it returns null



Comonly Used Operators

.Min()

- **Explanation:** find the minimum of the selected items;
- **Result:** Min number.

.Max()

- **Explanation:** find the maximum of the selected items.
- **Result:** Max number.

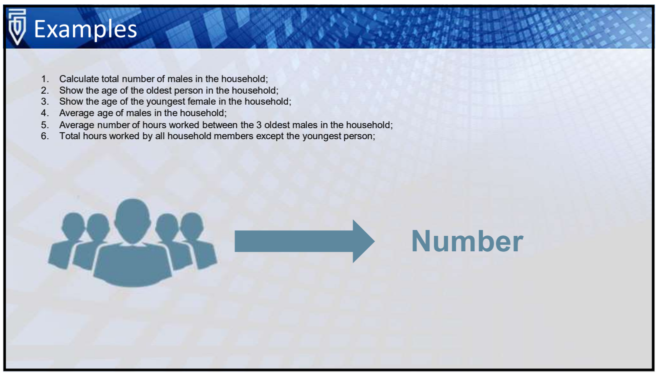
.Sum()

- **Explanation:** find the sum of the selected items.
- **Result.** The sum number.

. Average()

- **Explanation:** find the average (mean) of the selected items.
- **Result:** The average number.

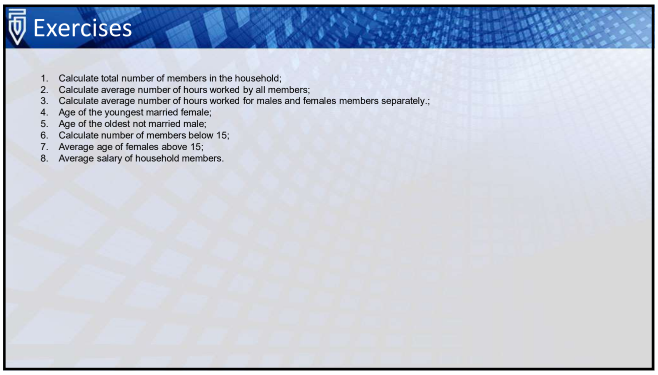
Note that Min(), Max(), Sum(), Average() skip null values.



Examples

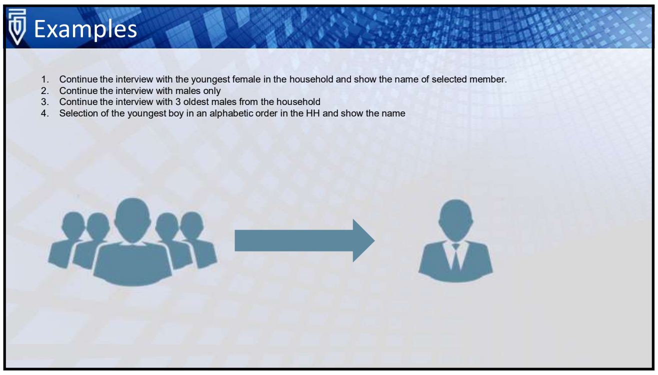
1. Calculate total number of males in the household;
2. Show the age of the oldest person in the household;
3. Show the age of the youngest female in the household;
4. Average age of males in the household;
5. Average number of hours worked between the 3 oldest males in the household;
6. Total hours worked by all household members except the youngest person;

Number



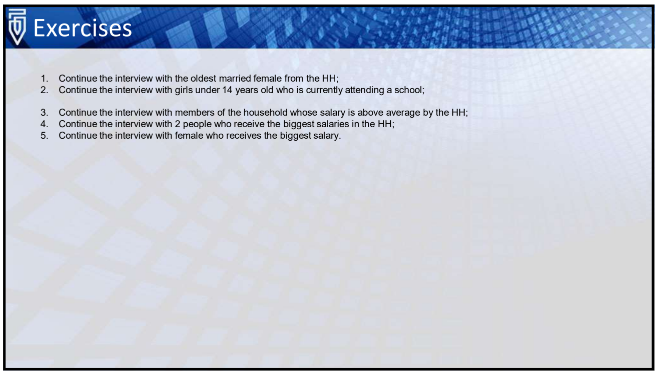
Exercises

1. Calculate total number of members in the household;
2. Calculate average number of hours worked by all members;
3. Calculate average number of hours worked for males and females members separately.;
4. Age of the youngest married female;
5. Age of the oldest not married male;
6. Calculate number of members below 15;
7. Average age of females above 15;
8. Average salary of household members.



Examples

1. Continue the interview with the youngest female in the household and show the name of selected member.
2. Continue the interview with males only
3. Continue the interview with 3 oldest males from the household
4. Selection of the youngest boy in an alphabetic order in the HH and show the name



Exercises

1. Continue the interview with the oldest married female from the HH;
2. Continue the interview with girls under 14 years old who is currently attending a school;

3. Continue the interview with members of the household whose salary is above average by the HH;
4. Continue the interview with 2 people who receive the biggest salaries in the HH;
5. Continue the interview with female who receives the biggest salary.

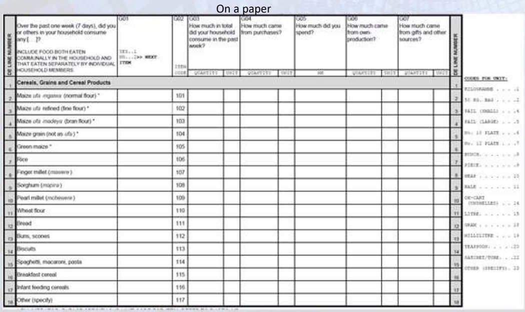
Lookup tables

What use for?

- Make sure the wage rate reported by the respondent corresponds to wage structure of the respondent's occupation.
- Validate that the GPS coordinate is recorded in a particular survey region
- Validate that the quantities of various food items are recorded in the right units. For example, liters for milk, kg for rice, and etc.
- Assert that yield per acre falls into expected bounds for each crop that the household grows.
- And e.c.

Lookup tables

On a paper



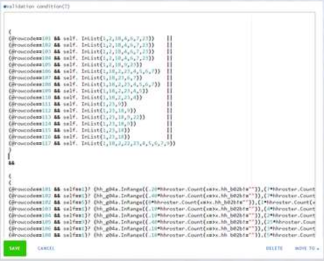
DE LINE NUMBER	Over the past one week (7 days), did you or others in your household consume any [...]? INCLUDE FOOD BOTH EATEN COMMUNALLY IN THE HOUSEHOLD AND THAT EATEN SEPARATELY BY INDIVIDUAL HOUSEHOLD MEMBERS	G01 YES...1 NO....2>> NEXT ITEM	G02 ITEM CODE	G03 How much in total did your household consume in the past week? QUANTITY	UNIT	G04 How much came from purchases? QUANTITY	UNIT	G05 How much did you spend? MK	G06 How much came from own-production? QUANTITY	UNIT	G07 How much came from gifts and other sources? QUANTITY	UNIT	DE LINE NUMBER
1	Cereals, Grains and Cereal Products												1
2	Maize ufa mgaiwa (normal flour) *		101										2
3	Maize ufa refined (fine flour) *		102										3
4	Maize ufa madeya (bran flour) *		103										4
5	Maize grain (not as ufa) *		104										5
6	Green maize *		105										6
7	Rice		106										7
8	Finger millet (mawere)		107										8
9	Sorghum (mapira)		108										9
10	Pearl millet (mchewere)		109										10
11	Wheat flour		110										11
12	Bread		111										12
13	Buns, scones		112										13
14	Biscuits		113										14
15	Spaghetti, macaroni, pasta		114										15
16	Breakfast cereal		115										16
17	Infant feeding cereals		116										17
18	Other (specify)		117										18

CODES FOR UNIT:

KILOGRAMME	1
50 KG. BAG	2
PAIL (SMALL) . . .	4
PAIL (LARGE) . . .	5
No. 10 PLATE . . .	6
No. 12 PLATE . . .	7
BUNCH.	8
PIECE.	9
HEAP	10
BALE	11
OX-CART (UNSHELLED). . .	14
LITRE.	15
GRAM	18
MILLILITRE	19
TEASPOON.	20
SATCHET/TUBE. . .	22
OTHER (SPECIFY). .	23

Lookup tables

One way to implement such validation would be to write a long condition that combines logical operators.



●validation condition(7)

```
{
(@rowcode==101 && self. InList(1,2,18,4,6,7,23))      ||
(@rowcode==102 && self. InList(1,2,18,4,6,7,23))      ||
(@rowcode==103 && self. InList(1,2,18,4,6,7,23))      ||
(@rowcode==104 && self. InList(1,2,18,4,6,7,23))      ||
(@rowcode==105 && self. InList(1,2,18,9,23))          ||
(@rowcode==106 && self. InList(1,18,2,23,4,5,6,7))    ||
(@rowcode==107 && self. InList(1,18,23,6,7))          ||
(@rowcode==108 && self. InList(1,18,2,23,4,5,6,7))    ||
(@rowcode==109 && self. InList(1,18,2,23,4,5))        ||
(@rowcode==110 && self. InList(1,18,2,23,4))          ||
(@rowcode==111 && self. InList(1,23,9))               ||
(@rowcode==112 && self. InList(1,23,18,9))            ||
(@rowcode==113 && self. InList(1,23,18,9,22))         ||
(@rowcode==114 && self. InList(1,23,18,9))            ||
(@rowcode==115 && self. InList(1,23,18))              ||
(@rowcode==116 && self. InList(1,23,18))              ||
(@rowcode==117 && self. InList(1,18,2,22,23,4,5,6,7,9))
)
|
&&

(
(
(@rowcode==101 && self==1)? (hh_g04a.InRange((.20*hhroster.Count(x=>x.hh_b02b!="")),(7*hhroster.Count
(@rowcode==102 && self==1)? (hh_g04a.InRange((.40*hhroster.Count(x=>x.hh_b02b!="")),(7*hhroster.Count
(@rowcode==102 && self==5)? (hh_g04a.InRange((0*hhroster.Count(x=>x.hh_b02b!="")),(1*hhroster.Count(x
(@rowcode==103 && self==1)? (hh_g04a.InRange((.10*hhroster.Count(x=>x.hh_b02b!="")),(4*hhroster.Count
(@rowcode==104 && self==1)? (hh_g04a.InRange((.10*hhroster.Count(x=>x.hh_b02b!="")),(2*hhroster.Count
(@rowcode==105 && self==3)? (hh_g04a.InRange((.40*hhroster.Count(x=>x.hh_b02b!="")),(25*hhroster.Coun
(@rowcode==106 && self==1)? (hh_g04a.InRange((.10*hhroster.Count(x=>x.hh_b02b!="")),(3*hhroster.Count
(@rowcode==108 && self==1)? (hh_g04a.InRange((.10*hhroster.Count(x=>x.hh_b02b!="")),(5*hhroster.Count
```

These conditions are difficult to:
- Read;
- Modify;
- Debug.

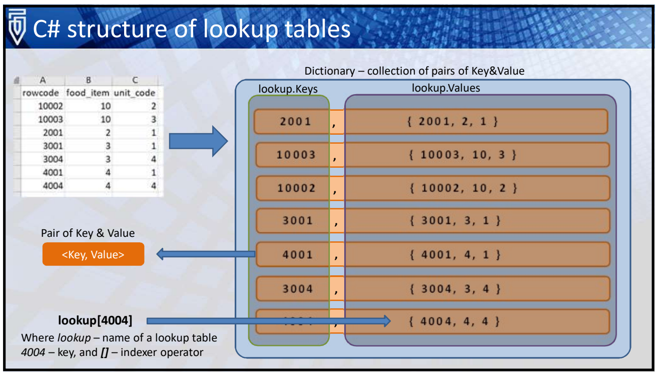
What are the lookup tables

- Lookup tables are tables of multiple values for a large set of similar items.
- Lookup tables are used to simplify validation and enablement conditions.
- A questionnaire can refer to multiple lookup tables of various sizes.
- Each lookup table must have a unique name.
- The values from lookup tables can be accessed by specifying three coordinates: table name, rowcode, and column name.

Lookup tables restrictions

$rowcode$	$colname_1$	$colname_2$		$colname_k$
C_1	$V_{1,1}$	$V_{1,2}$		$V_{1,k}$
C_2	$V_{2,1}$	$V_{2,2}$		$V_{2,k}$
C_m	$V_{m,1}$	$V_{m,2}$		$V_{m,k}$

The lookup tables must conform to the following format:
- Contain the "rowcode" column, and up to 10 other numeric columns with reference data.
- Values in "rowcode" column must be integer and unique.
- Other columns may contain repetitive content, as well as fractions(not-integer values).
- Lookup tables may include up to 5,000 rows of reference data.
- Multiple lookup tables may be defined within the same questionnaire.



C# structure of lookup tables

	A	B	C
	rowcode	food_item	unit_code
	10002	10	2
	10003	10	3
	2001	2	1
	3001	3	1
	3004	3	4
	4001	4	1
	4004	4	4

Dictionary – collection of pairs of Key&Value

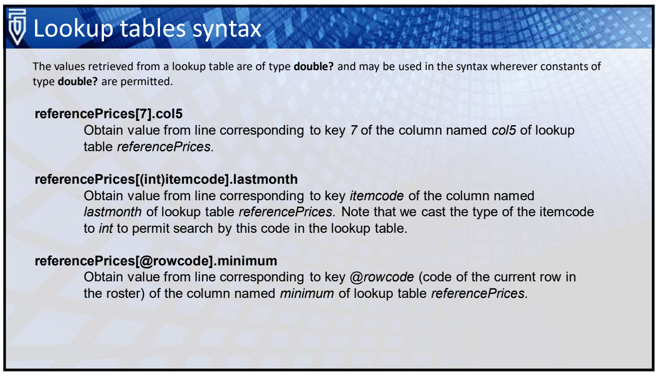
lookup.Keys		lookup.Values
2001	,	{ 2001, 2, 1 }
10003	,	{ 10003, 10, 3 }
10002	,	{ 10002, 10, 2 }
3001	,	{ 3001, 3, 1 }
4001	,	{ 4001, 4, 1 }
3004	,	{ 3004, 3, 4 }
	,	{ 4004, 4, 4 }

Pair of Key & Value

<Key, Value>

lookup[4004]

Where *lookup* – name of a lookup table
4004 – key, and *[]* – indexer operator



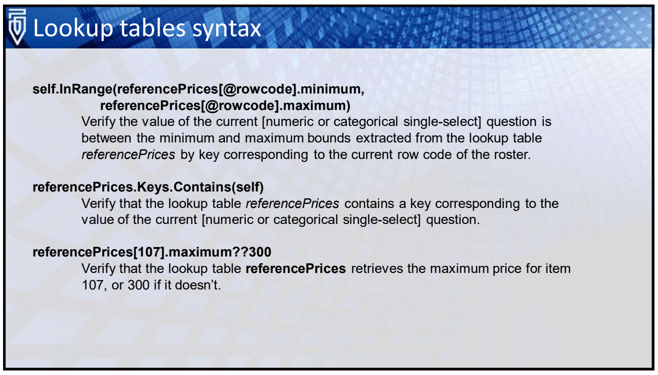
Lookup tables syntax

The values retrieved from a lookup table are of type **double?** and may be used in the syntax wherever constants of type **double?** are permitted.

referencePrices[7].col5
Obtain value from line corresponding to key *7* of the column named *col5* of lookup table *referencePrices*.

referencePrices[(int)itemcode].lastmonth
Obtain value from line corresponding to key *itemcode* of the column named *lastmonth* of lookup table *referencePrices*. Note that we cast the type of the itemcode to *int* to permit search by this code in the lookup table.

referencePrices[@rowcode].minimum
Obtain value from line corresponding to key *@rowcode* (code of the current row in the roster) of the column named *minimum* of lookup table *referencePrices*.

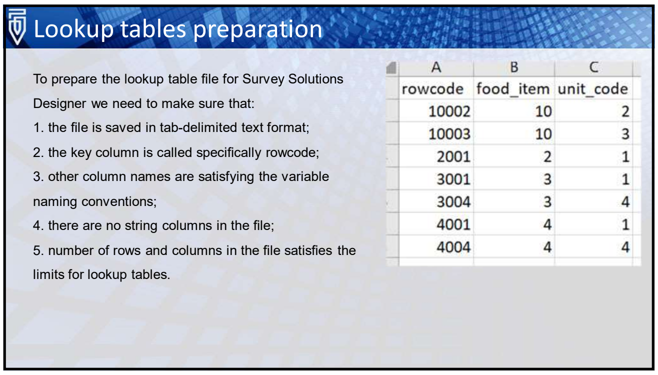


Lookup tables syntax

**self.InRange(referencePrices[@rowcode].minimum,
referencePrices[@rowcode].maximum)**
Verify the value of the current [numeric or categorical single-select] question is between the minimum and maximum bounds extracted from the lookup table *referencePrices* by key corresponding to the current row code of the roster.

referencePrices.Keys.Contains(self)
Verify that the lookup table *referencePrices* contains a key corresponding to the value of the current [numeric or categorical single-select] question.

referencePrices[107].maximum??300
Verify that the lookup table **referencePrices** retrieves the maximum price for item 107, or 300 if it doesn't.

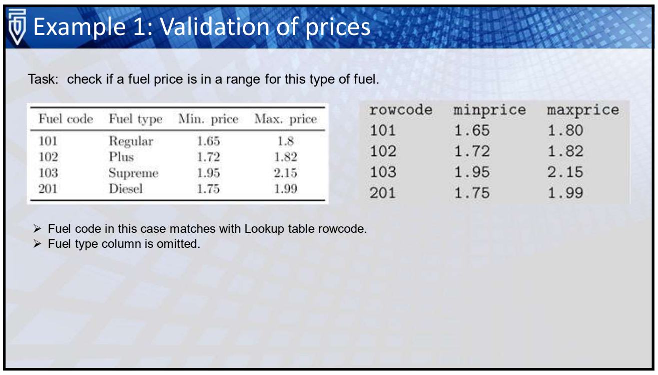


Lookup tables preparation

To prepare the lookup table file for Survey Solutions Designer we need to make sure that:

1. the file is saved in tab-delimited text format;
2. the key column is called specifically rowcode;
3. other column names are satisfying the variable naming conventions;
4. there are no string columns in the file;
5. number of rows and columns in the file satisfies the limits for lookup tables.

	A	B	C
	rowcode	food_item	unit_code
	10002	10	2
	10003	10	3
	2001	2	1
	3001	3	1
	3004	3	4
	4001	4	1
	4004	4	4



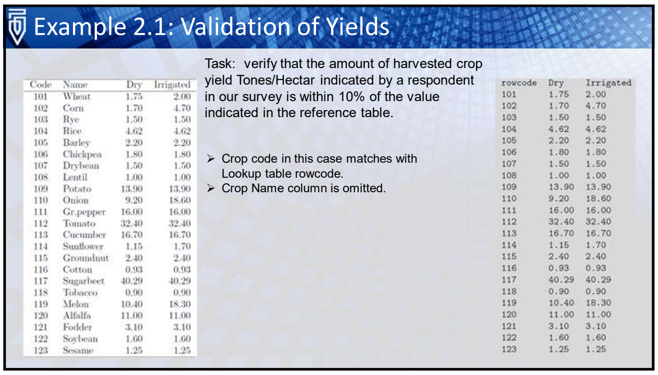
Example 1: Validation of prices

Task: check if a fuel price is in a range for this type of fuel.

Fuel code	Fuel type	Min. price	Max. price
101	Regular	1.65	1.8
102	Plus	1.72	1.82
103	Supreme	1.95	2.15
201	Diesel	1.75	1.99

```
rowcode  minprice  maxprice
101      1.65      1.80
102      1.72      1.82
103      1.95      2.15
201      1.75      1.99
```

- Fuel code in this case matches with Lookup table rowcode.
- Fuel type column is omitted.



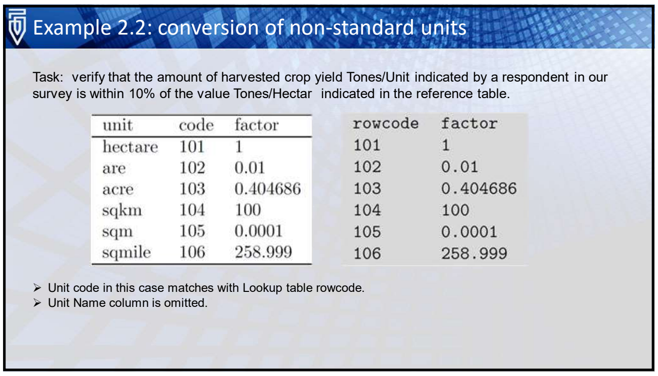
Example 2.1: Validation of Yields

Code	Name	Dry	Irrigated
101	Wheat	1.75	2.00
102	Corn	1.70	4.70
103	Rye	1.50	1.50
104	Rice	4.62	4.62
105	Barley	2.20	2.20
106	Chickpea	1.80	1.80
107	Drybean	1.50	1.50
108	Lentil	1.00	1.00
109	Potato	13.90	13.90
110	Onion	9.20	18.60
111	Gr.pepper	16.00	16.00
112	Tomato	32.40	32.40
113	Cucumber	16.70	16.70
114	Sunflower	1.15	1.70
115	Groundnut	2.40	2.40
116	Cotton	0.93	0.93
117	Sugarbeet	40.29	40.29
118	Tobacco	0.90	0.90
119	Melon	10.40	18.30
120	Alfalfa	11.00	11.00
121	Fodder	3.10	3.10
122	Soybean	1.60	1.60
123	Sesame	1.25	1.25

Task: verify that the amount of harvested crop yield Tones/Hectar indicated by a respondent in our survey is within 10% of the value indicated in the reference table.

- Crop code in this case matches with Lookup table rowcode.
- Crop Name column is omitted.

```
rowcode  Dry    Irrigated
101      1.75   2.00
102      1.70   4.70
103      1.50   1.50
104      4.62   4.62
105      2.20   2.20
106      1.80   1.80
107      1.50   1.50
108      1.00   1.00
109      13.90  13.90
110      9.20   18.60
111      16.00  16.00
112      32.40  32.40
113      16.70  16.70
114      1.15   1.70
115      2.40   2.40
116      0.93   0.93
117      40.29  40.29
118      0.90   0.90
119      10.40  18.30
120      11.00  11.00
121      3.10   3.10
122      1.60   1.60
123      1.25   1.25
```



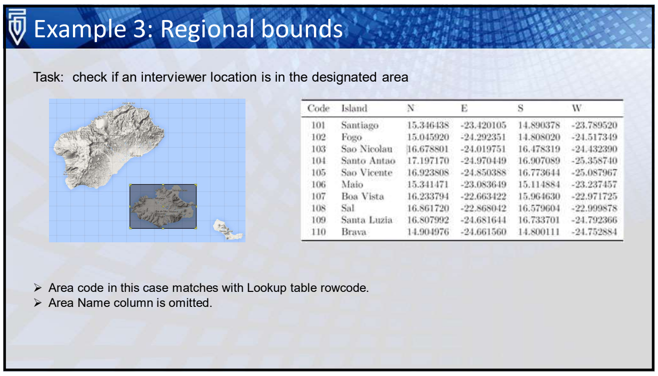
Example 2.2: conversion of non-standard units

Task: verify that the amount of harvested crop yield Tones/Unit indicated by a respondent in our survey is within 10% of the value Tones/Hectar indicated in the reference table.

unit	code	factor
hectare	101	1
are	102	0.01
acre	103	0.404686
sqkm	104	100
sqm	105	0.0001
sqmile	106	258.999

rowcode	factor
101	1
102	0.01
103	0.404686
104	100
105	0.0001
106	258.999

- Unit code in this case matches with Lookup table rowcode.
- Unit Name column is omitted.

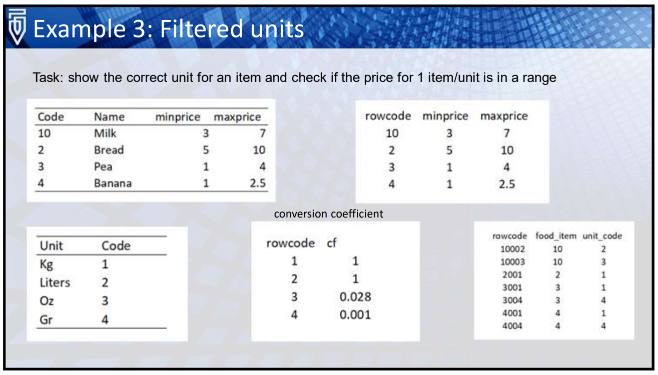


Example 3: Regional bounds

Task: check if an interviewer location is in the designated area

Code	Island	N	E	S	W
101	Santiago	15.346438	-23.420105	14.890378	-23.789520
102	Fogo	15.045920	-24.292351	14.808020	-24.517349
103	Sao Nicolau	16.678801	-24.019751	16.478319	-24.432390
104	Santo Antao	17.197170	-24.970449	16.907089	-25.358740
105	Sao Vicente	16.923808	-24.850388	16.773644	-25.087967
106	Maio	15.341471	-23.083649	15.114884	-23.237457
107	Boa Vista	16.233794	-22.663422	15.964630	-22.971725
108	Sal	16.861720	-22.868042	16.579604	-22.999878
109	Santa Luzia	16.807992	-24.681644	16.733701	-24.792366
110	Brava	14.904976	-24.661560	14.800111	-24.752884

- Area code in this case matches with Lookup table rowcode.
- Area Name column is omitted.



Example 3: Filtered units

Task: show the correct unit for an item and check if the price for 1 item/unit is in a range

Code	Name	minprice	maxprice
10	Milk	3	7
2	Bread	5	10
3	Pea	1	4
4	Banana	1	2.5

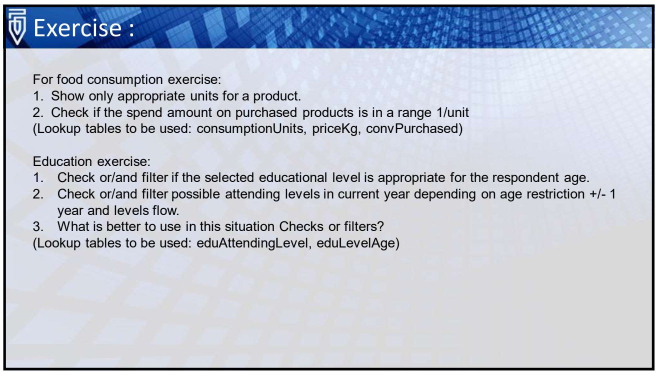
rowcode	minprice	maxprice
10	3	7
2	5	10
3	1	4
4	1	2.5

Unit	Code
Kg	1
Liters	2
Oz	3
Gr	4

conversion coefficient

rowcode	cf
1	1
2	1
3	0.028
4	0.001

rowcode	food_item	unit_code
10002	10	2
10003	10	3
2001	2	1
3001	3	1
3004	3	4
4001	4	1
4004	4	4



Exercise :

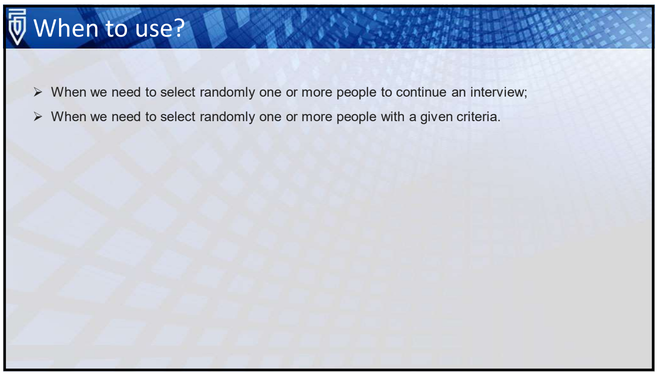
For food consumption exercise:
1. Show only appropriate units for a product.
2. Check if the spend amount on purchased products is in a range 1/unit

(Lookup tables to be used: consumptionUnits, priceKg, convPurchased)

Education exercise:
1. Check or/and filter if the selected educational level is appropriate for the respondent age.
2. Check or/and filter possible attending levels in current year depending on age restriction +/- 1 year and levels flow.
3. What is better to use in this situation Checks or filters?

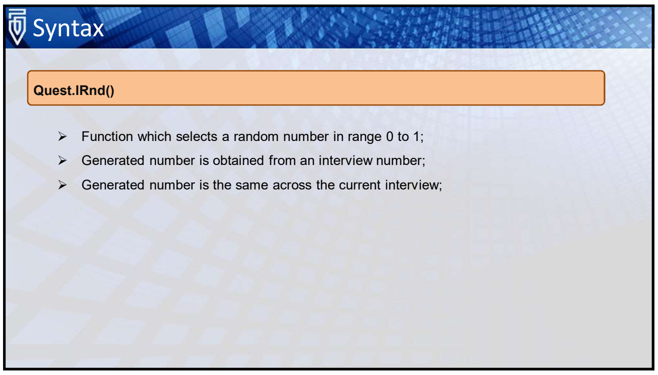
(Lookup tables to be used: eduAttendingLevel, eduLevelAge)

Random selection



When to use?

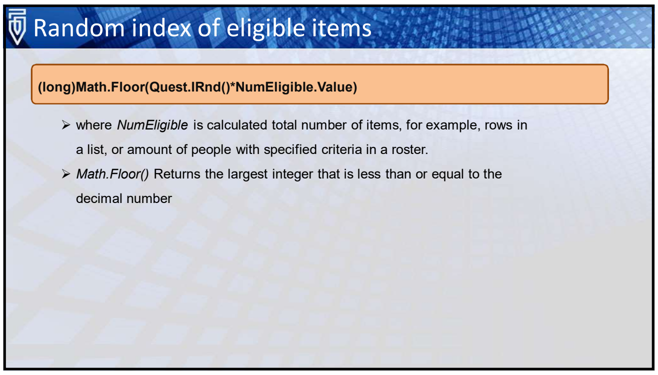
- When we need to select randomly one or more people to continue an interview;
- When we need to select randomly one or more people with a given criteria.



Syntax

```
Quest.IRnd()
```

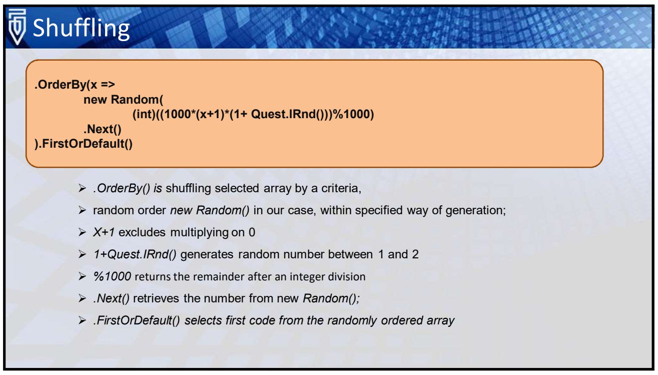
- Function which selects a random number in range 0 to 1;
- Generated number is obtained from an interview number;
- Generated number is the same across the current interview;



Random index of eligible items

```
(long)Math.Floor(Quest.IRnd()*NumEligible.Value)
```

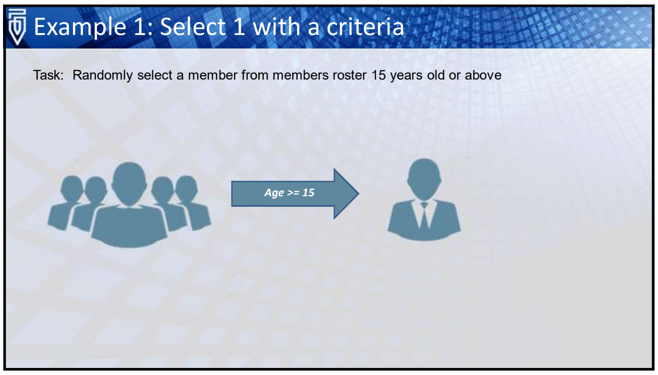
- where *NumEligible* is calculated total number of items, for example, rows in a list, or amount of people with specified criteria in a roster.
- *Math.Floor()* Returns the largest integer that is less than or equal to the decimal number



Shuffling

```
.OrderBy(x =>
        new Random(
                (int)((1000*(x+1)*(1+ Quest.IRnd()))%1000)
        .Next()
).FirstOrDefault()
```

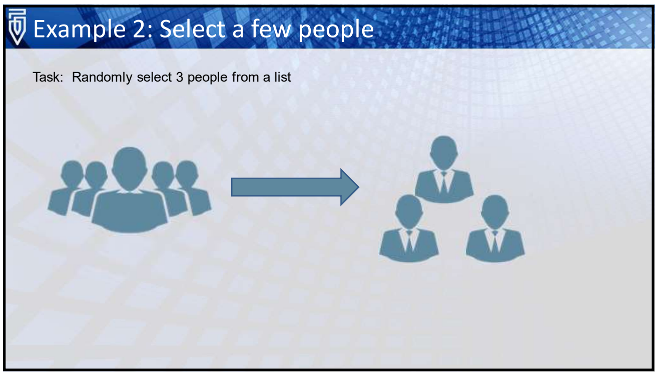
- *.OrderBy() is* shuffling selected array by a criteria,
- random order *new Random()* in our case, within specified way of generation;
- *X+1* excludes multiplying on 0
- *1+Quest.IRnd()* generates random number between 1 and 2
- *%1000* returns the remainder after an integer division
- *.Next()* retrieves the number from new *Random();*
- *.FirstOrDefault() selects first code from the randomly ordered array*



Example 1: Select 1 with a criteria

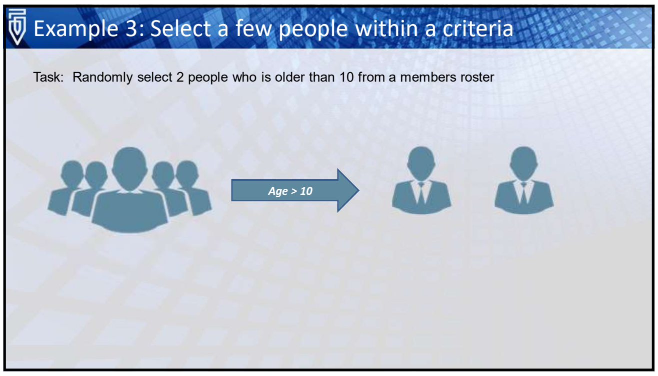
Task: Randomly select a member from members roster 15 years old or above

Age >= 15



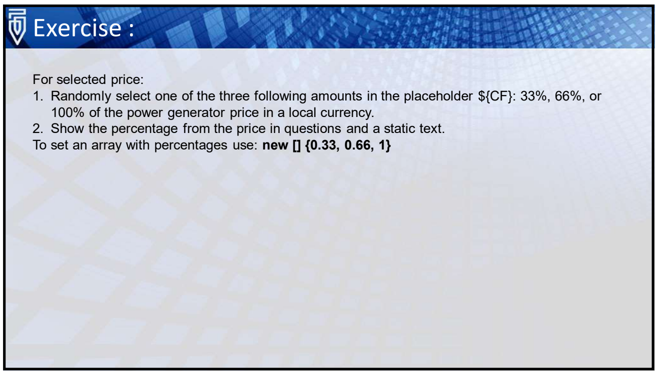
Example 2: Select a few people

Task: Randomly select 3 people from a list



Example 3: Select a few people within a criteria

Task: Randomly select 2 people who is older than 10 from a members roster



Exercise :

For selected price:

1. Randomly select one of the three following amounts in the placeholder ${CF}: 33%, 66%, or 100% of the power generator price in a local currency.
2. Show the percentage from the price in questions and a static text.

To set an array with percentages use: **new [] {0.33, 0.66, 1}**

Roster Vector

Roster Vector

Roster vector is an array of codes of a component.

- All questions have a roster vector.
- If a component is outside of any roster than its array is empty.
- Roster vector's array is not empty if its inside a roster, in this case it shown with blue text in Designer website.
- Roster vector array's length depends on nesting level of a roster.
- Components of the 0-nesting level roster have only one code in its array.

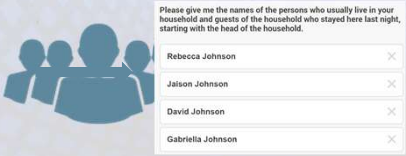
Roster Vector array

Codes in roster vector array of 0 nesting level are:

- generated by the SuSo if a source of the roster is a list or numeric question;
- comes from a multi-select question which is a source of the roster. In this case those codes are specified be the designer as option's Values codes for each option.
- specified by a Designer as Values for fixed roster items.

Each component in a nested roster inherits codes of the parent rosters to their arrays .

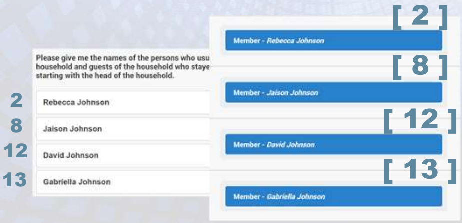
Roster Vector's array



Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household.

- Rebecca Johnson
- Jaison Johnson
- David Johnson
- Gabriella Johnson

Roster Vector's array

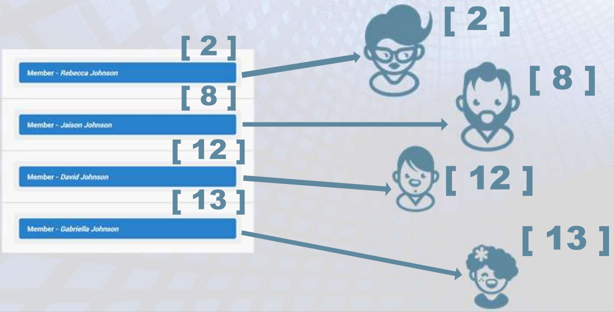


Please give me the names of the persons who usu household and guests of the household who staye starting with the head of the household.

2	Rebecca Johnson
8	Jaison Johnson
12	David Johnson
13	Gabriella Johnson

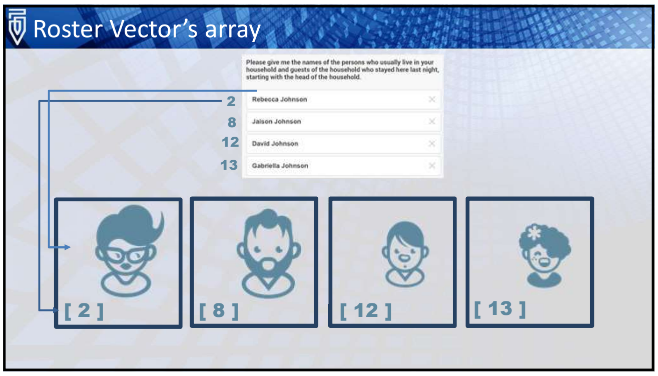
[2]	Member - *Rebecca Johnson*
[8]	Member - *Jaison Johnson*
[12]	Member - *David Johnson*
[13]	Member - *Gabriella Johnson*

Roster Vector's array



[2]	Member - *Rebecca Johnson*	[2]
[8]	Member - *Jaison Johnson*	[8]
[12]	Member - *David Johnson*	[12]
[13]	Member - *Gabriella Johnson*	[13]

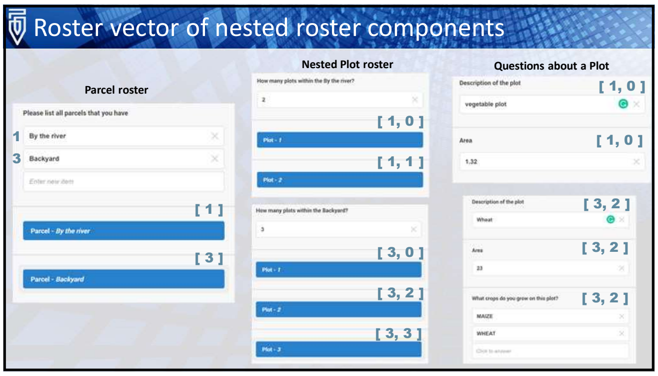
Roster Vector's array



Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household.

2	Rebecca Johnson
8	Jaison Johnson
12	David Johnson
13	Gabriella Johnson

Roster vector of nested roster components



Parcel roster

Please list all parcels that you have

1 By the river

3 Backyard

Enter new item

[1] Parcel - *By the river*

[3] Parcel - *Backyard*

Nested Plot roster

How many plots within the By the river?

2

[1, 0] Plot - *1*

[1, 1] Plot - *2*

How many plots within the Backyard?

3

[3, 0] Plot - *1*

[3, 2] Plot - *2*

[3, 3] Plot - *3*

Questions about a Plot

Description of the plot [1, 0]

vegetable plot

Area [1, 0]

1.32

Description of the plot [3, 2]

Wheat

Area [3, 2]

23

What crops do you grow on this plot? [3, 2]

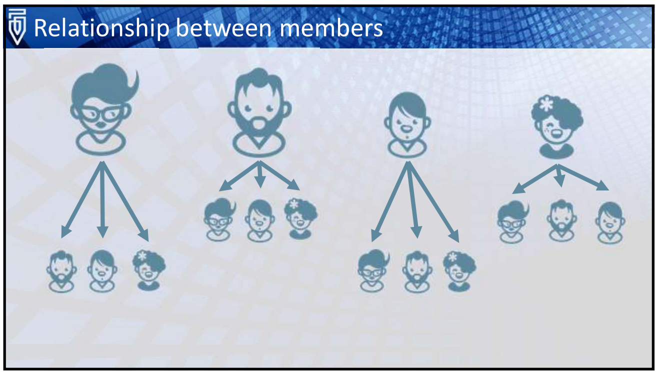
MAIZE

WHEAT

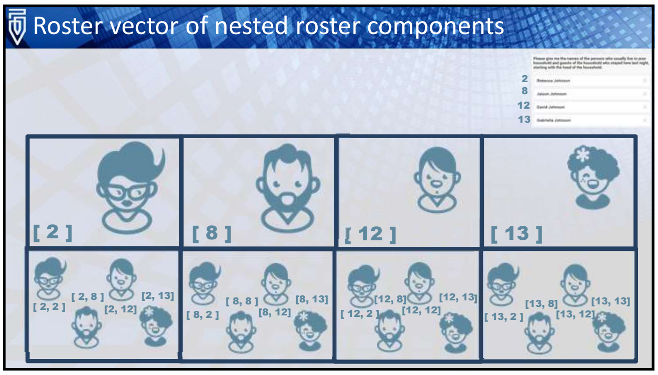
Click to answer

Collect relationship data between all members in the HH

Relationship between members



Roster vector of nested roster components



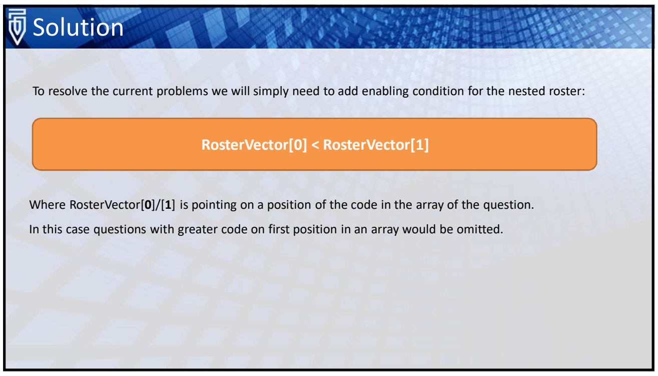
Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household.

2	Rebecca Johnson
8	Jaison Johnson
12	David Johnson
13	Gabriella Johnson

Problems

The same list question as for parent roster will be triggering nested roster. Because of that:

1. Each member would be asked about the relationship with him/herself
2. Questions about relationship would be duplicated 2 times.



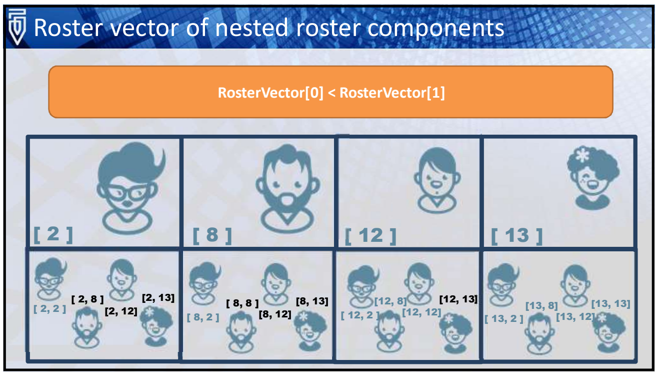
Solution

To resolve the current problems we will simply need to add enabling condition for the nested roster:

RosterVector[0] < RosterVector[1]

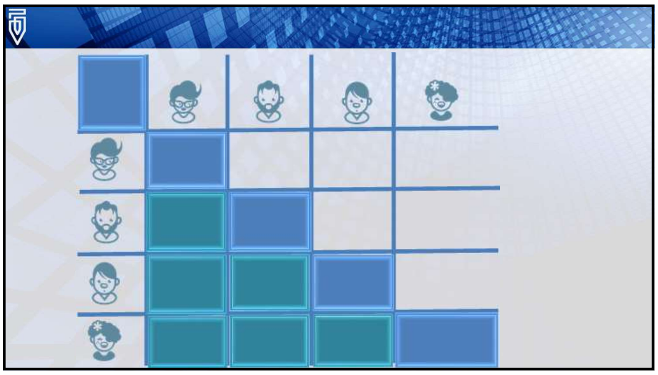
Where RosterVector[**0**]/[**1**] is pointing on a position of the code in the array of the question.

In this case questions with greater code on first position in an array would be omitted.



Roster vector of nested roster components

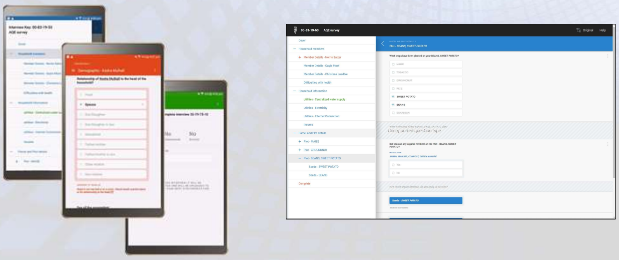
RosterVector[0] < RosterVector[1]



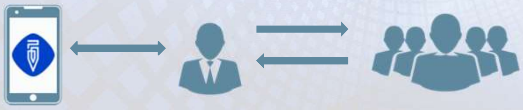
Computer Assisted Web Interviewing (CAWI)

Survey Solutions modes

Survey Solutions supports mixed mode surveys – CAPI, CAWI, CATI



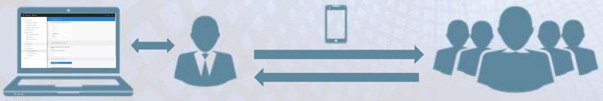
CAPI



Computer-assisted Personal Interviewing (CAPI):

1. Face-to-face data collection;
2. Interviewers should have had some training on the topic;
3. An interviewer conduct the interview and enter answers;
4. Internet connection is not required during the interview;
5. Data will be available to review after synchronizing a tablet with the server.

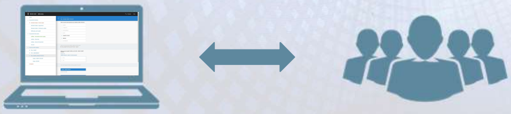
CATI



Computer-assisted Telephone Interviewing (CATI):

1. Usually requires a stetted up call center;
2. Requires one or more telephone operators;
3. Operators should have had some training on the topic;
4. An operator conduct the interview throughout the phone and enter answers;

CAWI



Computer-assisted Web Interviewing (CAWI):

1. Web-interview requires Internet connection;
2. The respondent answers the interview on his/her devise;
3. Respondent is untrained user;
4. An interview could be anonymous
5. Typically only one interview in the survey is filled out by a respondent.

So what is CAWI?

Computer-assisted web interviewing (CAWI) is an Internet surveying technique in which the interviewee follows a script provided in a website. In other words it's the web data collection. Could be collected on wide range of devices which have access to the Internet PCs, laptops, tablets and e.c..

Advantages and disadvantages

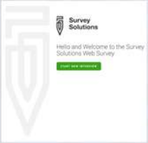
Advantages of CAWI:

1. doesn't require interviewers, their training and travel time;
2. doesn't require interviewer equipment (tablets) as data entry will be performed by the respondent using his/her device;
3. the whole survey can be faster (theoretically can be completed within a day);
4. some sensitive questions may be easier to answer in the absence of interviewer;
5. it may be possible to reach respondents, which would otherwise be not reachable (for example, those living in remote places, or conflict areas) but have Internet connection;
6. Low costs of the survey.

There are equally-important concerns:

1. Survey coordinators must be able to contact respondents to invite them to take a survey (for example, per email);
2. Not everyone has access to the Internet, so the response rate is limited
3. Studies indicate that the demographic that responds to online questionnaire invitations are generally biased to younger people.

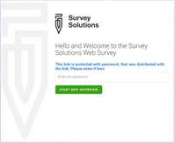
How does CAWI works?



Survey Solutions

Hello and Welcome to the Survey Solutions Web Survey

START NEW INTERVIEW



Survey Solutions

Hello and Welcome to the Survey Solutions Web Survey

This link is protected with password, that was distributed with the link. Please enter it here

Enter the password

START NEW INTERVIEW

1. Respondents log in to the interview clicking on a link.
2. The link can be published in a website or sent via email.
3. The respondent will display a short text introducing the survey and then he will proceed to answer the survey questions.
4. The survey can be distributed anonymously or with a unique personal links.

Anonymous distribution

- In anonymous distribution there's no connection between the respondent and the interview.
- This method is used when you have to guarantee anonymity to your respondents. In this case all the contacts will use the same link to log in. It can be published in a website, in social media or sent via email.
- It's good to remember that anonymous distribution doesn't prevent the same respondent to answer the questionnaire multiple times corrupting final data.

Personal unique link distribution

- Personal unique link distribution requires a different link for each respondent.
- Link could also be protected by a password.
- The Survey Solutions is then able to link respondents profiles in the database with interviews completed.
- This procedure is useful to get information as who completed the survey and who started the survey but didn't complete it.
- Tracking survey responses is important to perform mass actions on the database, for example to send a reminder to all those who didn't answer the questionnaire.

Setting up a CAWI survey in SuSo

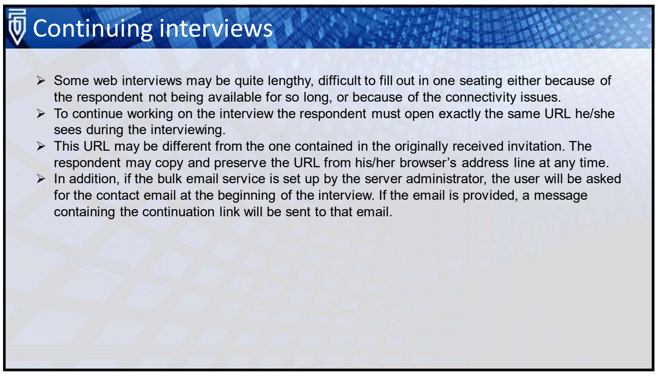
Conducting a CAWI survey requires the following:

1. Compose the questionnaire.
2. Test the questionnaire with Web-Tester for CAWI. If you are planning to have a mixed mode, than the questionnaire should be tested with Tester App and Web Tester.
3. Import the questionnaire to the data server.
4. Make web-assignments for the survey.
5. Activate the web-survey mode.
6. Distribute the links.
7. Review incoming data/follow up with the respondents if necessary.
8. De-activate the web-survey mode.

Composing the questionnaire

Because the respondents are untrained users it's important that the questionnaire is as simple as possible and that question texts are perfectly clear.

- The questionnaire should begin with a short introduction that informs the subject why the questionnaire is being conducted.
- Questions for questionnaire should be created in the most appropriate type of format that facilitates understanding.
- In creating the layout of the CAWI questionnaire, should be well structured. For example, if a subject selects "yes" to a question, the questionnaire would automatically jump to the next relevant question and vice versa.
- The questionnaire shouldn't be too big. Generally to answer 4 categorical questions take around 1 minute and one text question could take up to a few minutes. If questionnaire would be too big you risk to have an incorrect data.
- A brief "thank you" note should be included at the end of the questionnaire

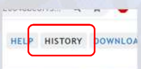


Continuing interviews

- Some web interviews may be quite lengthy, difficult to fill out in one seating either because of the respondent not being available for so long, or because of the connectivity issues.
- To continue working on the interview the respondent must open exactly the same URL he/she sees during the interviewing.
- This URL may be different from the one contained in the originally received invitation. The respondent may copy and preserve the URL from his/her browser's address line at any time.
- In addition, if the bulk email service is set up by the server administrator, the user will be asked for the contact email at the beginning of the interview. If the email is provided, a message containing the continuation link will be sent to that email.

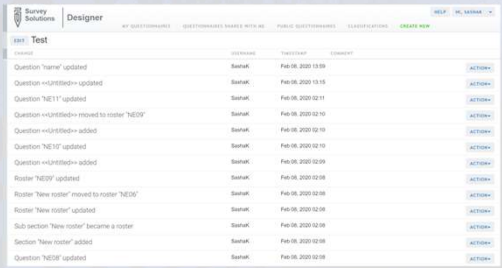
History

Recent Changes to the Questionnaire



To see the record of all recent changes made to the questionnaire, click on the ***History*** button located on the top right of the page.

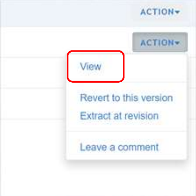
This page will list the question that was changed along with the username of the person who made the change, and the timestamp for when the change was done.



Test

CHANGE	USERNAME	TIMESTAMP	COMMENT	
Question "name" updated	SashaK	Feb 08, 2020 13:59		ACTION▾
Question <<Untitled>> updated	SashaK	Feb 08, 2020 13:15		ACTION▾
Question "NE11" updated	SashaK	Feb 08, 2020 02:11		ACTION▾
Question <<Untitled>> moved to roster "NE09"	SashaK	Feb 08, 2020 02:10		ACTION▾
Question <<Untitled>> added	SashaK	Feb 08, 2020 02:10		ACTION▾
Question "NE10" updated	SashaK	Feb 08, 2020 02:10		ACTION▾
Question <<Untitled>> added	SashaK	Feb 08, 2020 02:09		ACTION▾
Roster "NE09" updated	SashaK	Feb 08, 2020 02:08		ACTION▾
Roster "New roster" moved to roster "NE06"	SashaK	Feb 08, 2020 02:08		ACTION▾
Roster "New roster" updated	SashaK	Feb 08, 2020 02:08		ACTION▾
Sub section "New roster" became a roster	SashaK	Feb 08, 2020 02:08		ACTION▾
Section "New roster" added	SashaK	Feb 08, 2020 02:08		ACTION▾
Question "NE08" updated	SashaK	Feb 08, 2020 02:08		ACTION▾

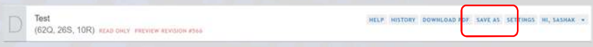
Recent Changes to the Questionnaire



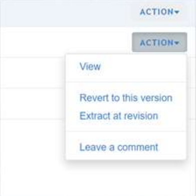
The Action button allows access to the menu with the following choices:

- ➢**View** - open the questionnaire in the state corresponding to this revision.
- ➢You can inspect the design of the questionnaire and even test it if necessary to verify what was the appearance and behavior at this specific revision. When you view an earlier revision, it shows you the questionnaire in the read-only mode.
- ➢With that you can verify the structure and syntax used in an earlier version, but can't do any changes.

Yet, there is a 'SAVE AS' button in the view mode that allows creating a copy of the questionnaire if you need it for edits (with the same result as 'extract at revision' below).



Recent Changes to the Questionnaire



The Action button allows access to the menu with the following choices:

- ➢**Revert to this version** - revert all the changes (made by all the collaborators) after this questionnaire revision.
- ➢**Extract at revision** - create a copy of the questionnaire corresponding to a specific revision (current questionnaire is not affected).
- ➢**Leave a comment** - leave a descriptive comment to the specific revision indicating useful information either about a particular edit event, or cumulatively for multiple edits.

Some of the items may be missing in the menu, depending on your access level to the questionnaire and recency of the recorded change event.

We have limitations of 500 last revisions. It means that the questionnaire could be revert only up to 500 changes back.

Exercise 5:

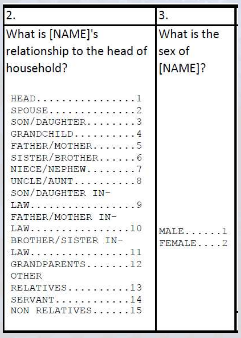
1. Create a new section "Demographics, Land & Livestock"
2. Download the PDF version of the questionnaire
3. Implement the section. Skip all enabling conditions.
4. Delete sections "Member's profile" and "Agriculture".
5. Compile and test your questionnaire with one of Testing tools.
6. Extract at revision the action before deleting sections.
7. Name the new copy "My first questionnaire" share it with me, with "View" rights. My email sakrivtcov@gmail.com
8. Rename the questionnaire "My questionnaire" to "Training examples"

Categorical questions

Survey Solutions
Designer

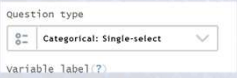
Single-select Question

On a paper



2.	3.
What is [NAME]'s relationship to the head of household?	What is the sex of [NAME]?
HEAD................1 SPOUSE..............2 SON/DAUGHTER........3 GRANDCHILD..........4 FATHER/MOTHER.......5 SISTER/BROTHER......6 NIECE/NEPHEW........7 UNCLE/AUNT..........8 SON/DAUGHTER IN-LAW................9 FATHER/MOTHER IN-LAW................10 BROTHER/SISTER IN-LAW................11 GRANDPARENTS.......12 OTHER RELATIVES..........13 SERVANT............14 NON RELATIVES......15	MALE......1 FEMALE....2

Single-select Question

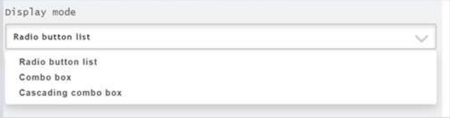


Question type

Categorical: Single-select

Variable label (?)

1. used when the possible answers are known or restricted to a certain set and only one option may be selected.
2. for example: gender is male or female, location is urban or rural.
3. You can include "none of the above" to the categories to make the question always answerable;
4. categories are defined as pairs of codes and corresponding labels, such as 1 Urban, 2 Rural.

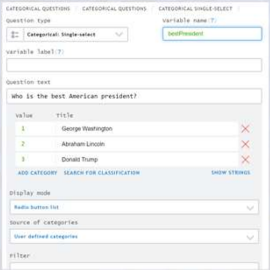


Display mode

Radio button list

Single-select: Radio button

Limit for this mode is up to 200 options that could be displayed on the screen at a time



CATEGORICAL QUESTIONS / CATEGORICAL QUESTIONS / CATEGORICAL SINGLE-SELECT /

Question type: Categorical: Single-select

Variable name (?): bestPresident

Variable label (?)

Question text: Who is the best American president?

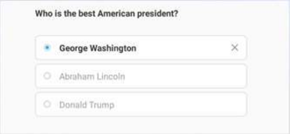
Value	Title
1	George Washington
2	Abraham Lincoln
3	Donald Trump

ADD CATEGORY
SEARCH FOR CLASSIFICATION
SHOW STRINGS

Display mode: Radio button list

Source of categories: User defined categories

Filter



Who is the best American president?

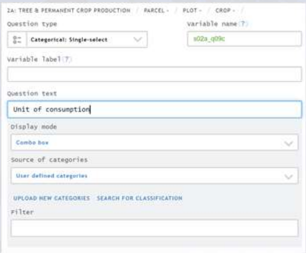
● George Washington

○ Abraham Lincoln

○ Donald Trump

Single-select: Combo box

✓Combo box question is a particular kind of a single choice categorical question.
✓It is convenient and even a necessity, when the number of choices is large and cannot be represented on a tablet screen.
✓A user makes a selection from the auto complete control by typing the beginning of the item, then selecting from a short list.



2A: TREE & PERMANENT CROP PRODUCTION / PARCEL - / PLOT - / CROP - /

Question type: Categorical: Single-select

Variable name (?): s02a_q09c

Variable label (?)

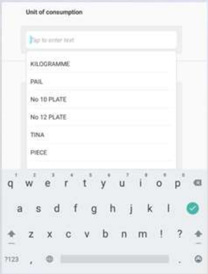
Question text: Unit of consumption

Display mode: Combo box

Source of categories: User defined categories

UPLOAD NEW CATEGORIES
SEARCH FOR CLASSIFICATION

Filter



Unit of consumption

Tap to enter text

KILOGRAMME

PAIL

No 10 PLATE

No 12 PLATE

TINA

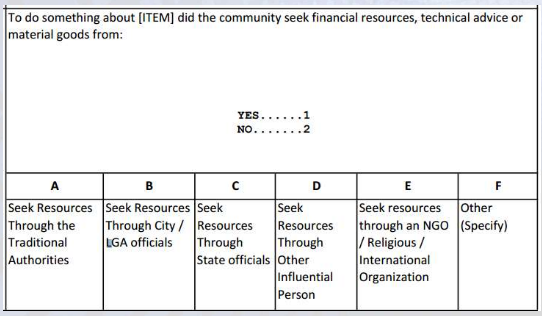
PIECE

Single-select

LIVE DEMO: Single-select

Multi-select Question

On a paper

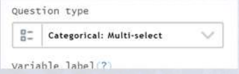


To do something about [ITEM] did the community seek financial resources, technical advice or material goods from:

YES......1
NO.......2

A	B	C	D	E	F
Seek Resources Through the Traditional Authorities	Seek Resources Through City / LGA officials	Seek Resources Through State officials	Seek Resources Through Other Influential Person	Seek resources through an NGO / Religious / International Organization	Other (Specify)

Multi-select Question

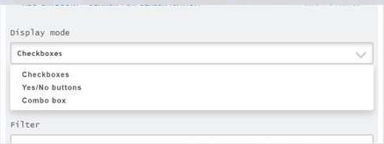


Question type
Categorical: Multi-select
Variable label (?)

➢convenient when yes/no question must be asked regarding many items;

➢for example: “Do you have in your household any of the following: stove, refrigerator, dishwasher, microwave oven, ...?”

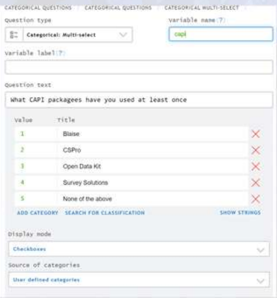
➢interviewer may select for each of the items whether the answer is positive or not;



Display mode
Checkboxes
- Checkboxes
- Yes/No buttons
- Combo box

Filter

Multi-select: Checkbox

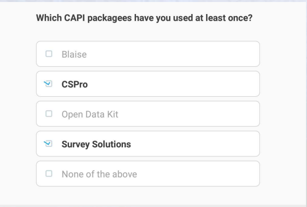


CATEGORICAL QUESTIONS / CATEGORICAL QUESTIONS / CATEGORICAL MULTI-SELECT

Question type: Categorical: Multi-select
Variable name (?): capi
Variable label (?)
Question text: What CAPI packagees have you used at least once

Value	Title
1	Blaise
2	CSPro
3	Open Data Kit
4	Survey Solutions
5	None of the above

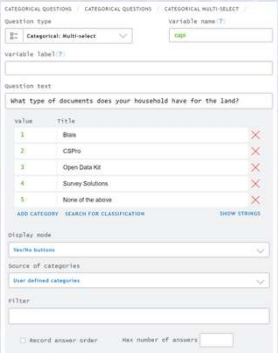
Display mode: Checkboxes
Source of categories: User defined categories



Which CAPI packagees have you used at least once?

- ☐ Blaise
- ☑ CSPro
- ☐ Open Data Kit
- ☑ Survey Solutions
- ☐ None of the above

Multi-select: Yes/no questions

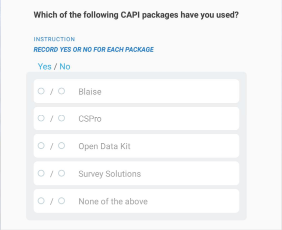


CATEGORICAL QUESTIONS / CATEGORICAL QUESTIONS / CATEGORICAL MULTI-SELECT

Question type: Categorical: Multi-select
Variable name (?): capi
Variable label (?)
Question text: What type of documents does your household have for the land?

Value	Title
1	Blais
2	CSPro
3	Open Data Kit
4	Survey Solutions
5	None of the above

Display mode: Yes/No buttons
Source of categories: User defined categories
Filter
☐ Record answer order
Max number of answers



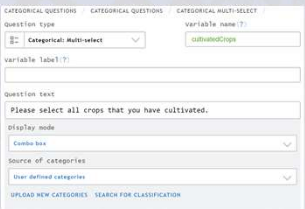
Which of the following CAPI packages have you used?

INSTRUCTION
RECORD YES OR NO FOR EACH PACKAGE

Yes / No
- ○ / ○ Blaise
- ○ / ○ CSPro
- ○ / ○ Open Data Kit
- ○ / ○ Survey Solutions
- ○ / ○ None of the above

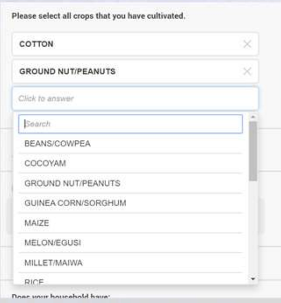
Multi-select: Combo box

- ➢ The typical use of this kind of question is most suitable for, e.g. agricultural surveys, where question like *“What crops do you grow on this plot?”* are common, and simply a large number of possible option categories
- ➢ The number of positive selections is still limited up to 200



CATEGORICAL QUESTIONS / CATEGORICAL QUESTIONS / CATEGORICAL MULTI-SELECT

Question type: Categorical: Multi-select
Variable name (?): cultivatedCrops
Variable label (?)
Question text: Please select all crops that you have cultivated.
Display mode: Combo box
Source of categories: User defined categories

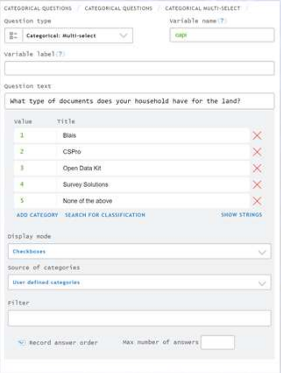


Please select all crops that you have cultivated.

COTTON ✕
GROUND NUT/PEANUTS ✕
Click to answer
Search
- BEANS/COWPEA
- COCOYAM
- GROUND NUT/PEANUTS
- GUINEA CORN/SORGHUM
- MAIZE
- MELON/EGUSI
- MILLET/MAIWA
- RICE

Does your household have:

Multi-select: Ordered



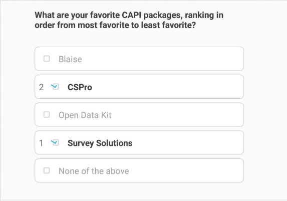
CATEGORICAL QUESTIONS / CATEGORICAL QUESTIONS / CATEGORICAL MULTI-SELECT

Question type: Categorical: Multi-select
Variable name (?): capi
Variable label (?)
Question text: What type of documents does your household have for the land?

Value	Title
1	Blais
2	CSPro
3	Open Data Kit
4	Survey Solutions
5	None of the above

Display mode: Checkboxes
Source of categories: User defined categories
Filter
☑ Record answer order
Max number of answers

Multi-select questions can be of two kinds: ordered and not ordered. For ordered questions the order of selection of each item is also recorded:

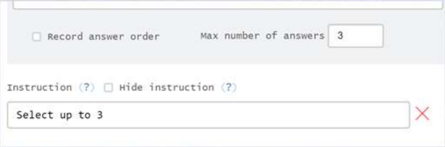


What are your favorite CAPI packages, ranking in order from most favorite to least favorite?

- ☐ Blaise
- 2 ☑ CSPro
- ☐ Open Data Kit
- 1 ☑ Survey Solutions
- ☐ None of the above

Multi-select: Limits

Number of selected categories can be limited by a certain value (for example 3):



☐ Record answer order   Max number of answers 3

Instruction (?) ☐ Hide instruction (?)

Select up to 3

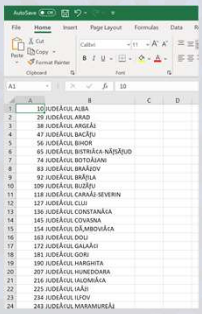
Don't forget to include an instruction about amount of allowed answers.

Multi-select

LIVE DEMO: multi-select

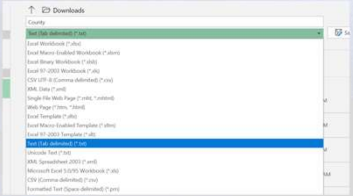
How to createe a Combo box file

To create an auto complete question:
Prepare a file of choices: tab delimited file with two columns numeric code and text label.



A1 | 10

	A	B	C	D
1	10	JUDEÃ¢UL ALBA		
2	29	JUDEÃ¢UL ARAD		
3	38	JUDEÃ¢UL ARGEÅž		
4	47	JUDEÃ¢UL BACÄƒU		
5	56	JUDEÃ¢UL BIHOR		
6	65	JUDEÃ¢UL BISTRIÃ¢A-NÄƒSÄƒUD		
7	74	JUDEÃ¢UL BOTOÅžANI		
8	83	JUDEÃ¢UL BRAÅžOV		
9	92	JUDEÃ¢UL BRÄƒILA		
10	109	JUDEÃ¢UL BUZÄƒU		
11	118	JUDEÃ¢UL CARAÅž-SEVERIN		
12	127	JUDEÃ¢UL CLUJ		
13	136	JUDEÃ¢UL CONSTANÃ¢A		
14	145	JUDEÃ¢UL COVASNA		
15	154	JUDEÃ¢UL DÃ‚MBOVIÃ¢A		
16	163	JUDEÃ¢UL DOLJ		
17	172	JUDEÃ¢UL GALAÃ¢I		
18	181	JUDEÃ¢UL GORJ		
19	190	JUDEÃ¢UL HARGHITA		
20	207	JUDEÃ¢UL HUNEDOARA		
21	216	JUDEÃ¢UL IALOMIÃ¢A		
22	225	JUDEÃ¢UL IAÅžI		
23	234	JUDEÃ¢UL ILFOV		
24	243	JUDEÃ¢UL MARAMUREÅž		



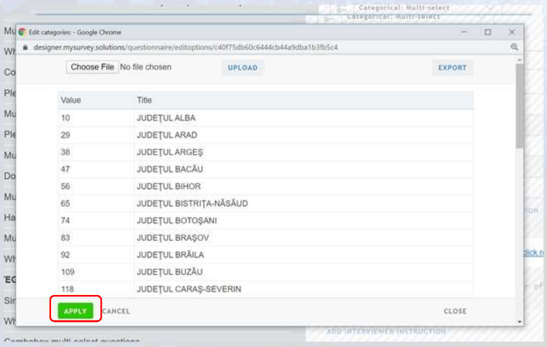
Downloads

County

Text (Tab delimited) (*.txt)

Excel Workbook (*.xlsx)
Excel Macro-Enabled Workbook (*.xlsm)
Excel Binary Workbook (*.xlsb)
Excel 97-2003 Workbook (*.xls)
CSV UTF-8 (Comma delimited) (*.csv)
XML Data (*.xml)
Single File Web Page (*.mht, *.mhtml)
Web Page (*.htm, *.html)
Excel Template (*.xltx)
Excel Macro-Enabled Template (*.xltm)
Excel 97-2003 Template (*.xlt)
Text (Tab delimited) (*.txt)
Unicode Text (*.txt)
XML Spreadsheet 2003 (*.xml)
Microsoft Excel 5.0/95 Workbook (*.xls)
CSV (Comma delimited) (*.csv)
Formatted Text (Space delimited) (*.prn)

How to upload a Combo box file



Categorical: Multi-select
Edit categories: - Google Chrome
Choose File
UPLOAD
EXPORT
APPLY
CANCEL
CLOSE
ADD INTERVIEWER INSTRUCTION

designer.mysurvey.solutions/questionnaire/editoptions/c40f75db60c6444cb44a9dba1b3fb5c4

No file chosen

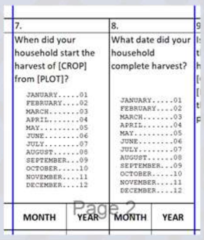
Value	Title
10	JUDEȚUL ALBA
29	JUDEȚUL ARAD
38	JUDEȚUL ARGEȘ
47	JUDEȚUL BACĂU
56	JUDEȚUL BIHOR
65	JUDEȚUL BISTRIȚA-NĂSĂUD
74	JUDEȚUL BOTOȘANI
83	JUDEȚUL BRAȘOV
92	JUDEȚUL BRĂILA
109	JUDEȚUL BUZĂU
118	JUDEȚUL CARAȘ-SEVERIN

Combo box

LIVE DEMO: how to create combo box file

Reusable categories

A questionnaire designer may define a set of categories and use them multiple times across the questionnaire in different single-select and multi-select questions. For example, the same list of all countries in the world could be reused for questions *"Which countries have you visited?"*, *"Which country did you visit last?"*, *"Which country do you plan to go next?"*.



7.		8.	
When did your household start the harvest of [CROP] from [PLOT]? JANUARY.....01 FEBRUARY....02 MARCH.......03 APRIL.......04 MAY.........05 JUNE........06 JULY........07 AUGUST......08 SEPTEMBER...09 OCTOBER.....10 NOVEMBER....11 DECEMBER....12		What date did your household complete harvest? JANUARY.....01 FEBRUARY....02 MARCH.......03 APRIL.......04 MAY.........05 JUNE........06 JULY........07 AUGUST......08 SEPTEMBER...09 OCTOBER.....10 NOVEMBER....11 DECEMBER....12	
MONTH	YEAR	MONTH	YEAR

There are numerous advantages of this approach:

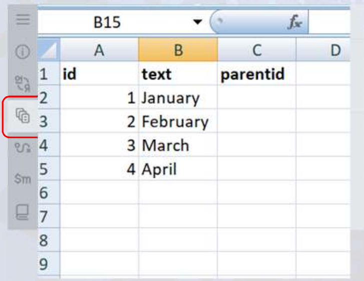
✓Categories are defined once, subsequent reuse is faster for the designer;

✓Any changes in the list immediately affect all questions where these categories are used;

✓The questionnaire becomes more compact (in terms of its size);

✓There is less work for the translator as the translation needs to be supplied only once.

Reusable categories: Step 1

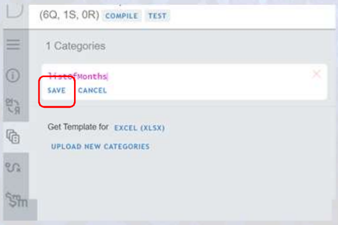


	A	B	C	D
1	id	text	parentid	
2	1	January		
3	2	February		
4	3	March		
5	4	April		
6				
7				
8				
9				

To create a categories file:

1. Click the Categories icon located on advanced panel.
2. Download the template.
3. Add your categories to the file.
   1. ID – value(code) of an option;
   2. Text – Title(text) of an option;
   3. ParentId – used for cascading combo box mode.
4. Safe file as tab delimited.

Reusable categories: Step 2



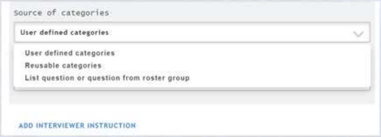
After you created tab file with categories:

1. Click Upload New Categories button.
2. Specify the name of collection and press the Save button

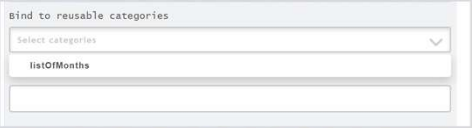
Reusable categories: Step 3

To add a Collection of categories to a categorical question:

1. Open a question properties;
2. Select source of categories "Reusable categories";



3. Select a Collection.

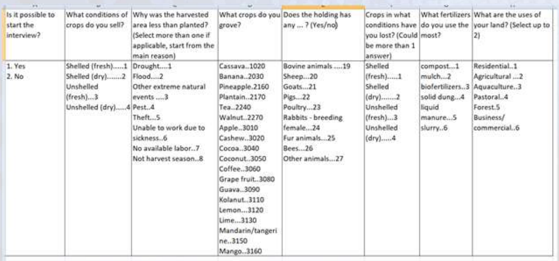


Reusable categories

LIVE DEMO: reusable categories

Exercise 4

1. Create a new section in your questionnaire with "Agriculture" title.
2. Add following questions to the section.



Is it possible to start the interview?	What conditions of crops do you sell?	Why was the harvested area less than planted? (Select more than one if applicable, start from the main reason)	What crops do you grove?	Does the holding has any ... ? (Yes/no)	Crops in what conditions have you lost? (Could be more than 1 answer)	What fertilizers do you use the most?	What are the uses of your land? (Select up to 2)
1. Yes 2. No	Shelled (fresh).....1 Shelled (dry)........2 Unshelled (fresh)...3 Unshelled (dry).....4	Drought....1 Flood....2 Other extreme natural events ....3 Pest..4 Theft...5 Unable to work due to sickness..6 No available labor..7 Not harvest season..8	Cassava..1020 Banana..2030 Pineapple.2160 Plantain..2170 Tea..2240 Walnut..2270 Apple..3010 Cashew..3020 Cocoa..3040 Coconut..3050 Coffee..3060 Grape fruit..3080 Guava..3090 Kolanut..3110 Lemon...3120 Lime...3130 Mandarin/tangerine..3150 Mango..3160	Bovine animals ....19 Sheep...20 Goats...21 Pigs...22 Poultry...23 Rabbits - breeding female...24 Fur animals...25 Bees...26 Other animals...27	Shelled (fresh)......1 Shelled (dry)........2 Unshelled (fresh)...3 Unshelled (dry).....4	compost...1 mulch...2 biofertilizers..3 solid dung...4 liquid manure...5 slurry..6	Residential..1 Agricultural ...2 Aquaculture..3 Pastoral..4 Forest.5 Business/ commercial..6

3. Create a Reusable categories called "cropConditions" with categories from the questions above.
4. Replace Your categories on Reusable one in questions 2 and 6.
5. Compile your questionnaire and test the questionnaire with both Tester tools.

Tester application / Web Tester

Survey Solutions
Designer

Test CAPI/CAWI

Why test?

1. To confirm CAPI/CAWI mirrors PAPI;
2. To verify that CAPI/CAWI captures all the relevant data for all relevant scenarios;
3. To avoid making changes after the survey has launched.

Tester tools

1. Testers allow you to test the questionnaire to get rid of any bugs or issues before data collection;
2. This will also let you test the layout and flow of the questionnaire on Survey Solutions;
3. Tester tools will let you see the questionnaire as the interviewer would see it in the field/screen;
4. Requires internet connectivity to load the questionnaire;
5. Once the questionnaire is loaded, you do not need to be connected to the internet to test the questionnaire for CAPI.

What to test (in questionnaire)?

✓Questionnaire content (questions);

✓Answer options;

✓Enabling conditions (skip patterns);

✓Validation conditions (and corresponding messages);

✓Filtering conditions;

✓Randomization;

✓Text piping;

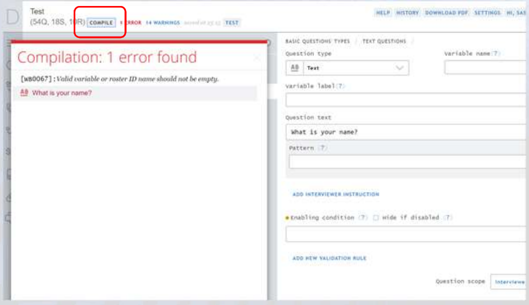
✓Calculated variables;

✓Grouping of questions and questionnaire navigation;

✓Performance and usability.

Compiling in Designer

Before testing your questionnaire you need to be sure that you don't have critical design-time errors.
The best way to do that is to use Compile future on Designer website.



Test
(54Q, 18S, 10R)

Compilation: 1 error found

[WB0067]: *Valid variable or roster ID name should not be empty.*

What is your name?

Question type: Text

Question text: What is your name?

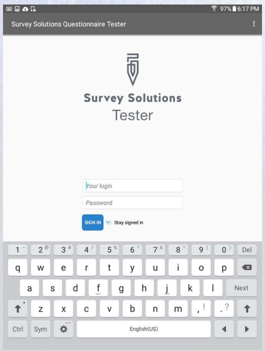
Question scope: Interviewer

Compiling in Designer

✓Designer tool provides a validation facility compile that verifies the questionnaire for omissions (e.g. variable names), syntax errors and other design-time errors.
✓A questionnaire may contain errors of multiple types. They are listed after compilation is completed.
✓Hover mouse pointer over the error to get a detailed message in case of syntax errors.
✓Recompile allows to quickly re-verify the questionnaire once changes are made to fix the identified errors.
✓**Questionnaires with design-time errors can not be tested** using other means.
✓Compiler also may produce a number of warning messages and suggestions for questionnaire modification.

Tester application for CAPI

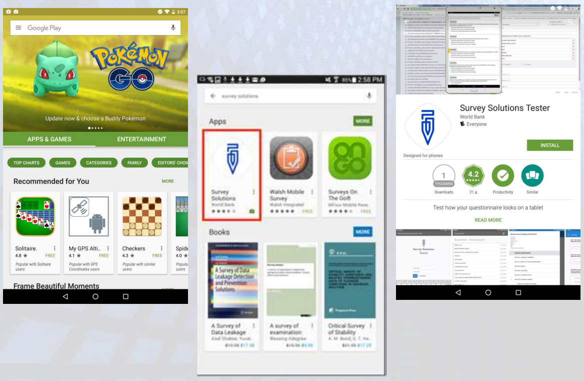
Tester application:
➢is a specialized Android tablet application.
➢can be downloaded from Google Play (market). Search for Survey Solutions Tester.
➢allows to get a look and feel of the actual data collection application.
➢doesn't store or send the data anywhere (although can save scenarios, but not for export/processing).
➢doesn't require Survey Solutions infrastructure (server).
➢talks directly to the Survey Solutions Designer;
➢use your Designer credentials to login to the Tester.



Install Survey Solutions Tester

1. First, you will have to get a google account if you do not already have one.
2. Open the Google Play store. The icon looks like:
3. If the tablet is already signed into a google account, then you will be able to use it. If not, then you will have to sign into your google account.
4. Search for "Survey Solutions"
5. Tap on the Tester app and tap on Install button

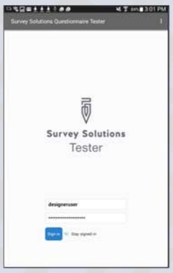
Install Survey Solutions Tester



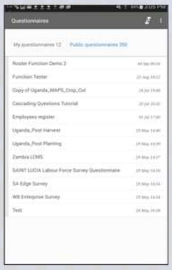
Using Tester app

➢Find and open the Tester application on your tablet. The icon for the application will be the blue Survey Solutions "pencil" logo.

Sign in using the account name and password you use for Designer

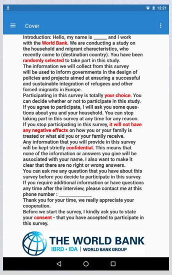


Select the questionnaire you want to test from the list.



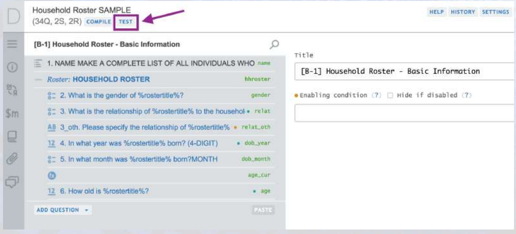
Roster Function Demo 2
Function Tester
Copy of Uganda_MAPS_Drop_Out
Cascading Questions Tutorial
Employees register
Uganda_Post Harvest
Uganda_Post Planting
Zambia LCMS
SAINT LUCIA Labour Force Survey Questionnaire
SA Edge Survey
WB Enterprise Survey
Test

Test your questionnaire



Introduction: Hello, my name is _____ and I work with the World Bank. We are conducting a study on the household and migrant characteristics, who recently came to (destination country). You have been randomly selected to take part in this study.
The information we will collect from this survey will be used to inform governments in the design of policies and projects aimed at ensuring a successful and sustainable integration of refugees and other forced migrants in Europe.
Participating in this survey is totally your choice. You can decide whether or not to participate in this study. If you agree to participate, I will ask you some questions about you and your household. You can stop taking part in this survey at any time for any reason. If you stop participating in this survey, it will not have any negative effects on how you or your family is treated or what aid you or your family receive.
Any information that you will provide in this survey will be kept strictly confidential. This means that none of the information or answers you give will be associated with your name. I also want to make it clear that there are no right or wrong answers.
You can ask me any question that you have about this survey before you decide to participate in this survey. If you require additional information or have questions any time after the interview, please contact me at this phone number : ____________
Thank you for your time, we really appreciate your cooperation.
Before we start the survey, I kindly ask you to state your consent - that you have accepted to participate in this survey.

Online Tester for CAWI



[B-1] Household Roster - Basic Information

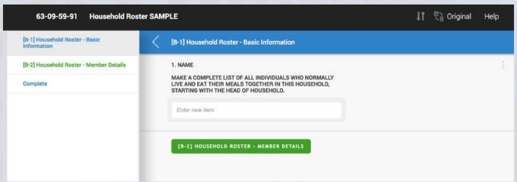
1. NAME MAKE A COMPLETE LIST OF ALL INDIVIDUALS WHO name
Roster: HOUSEHOLD ROSTER hhroster
2. What is the gender of %rostertitle%? gender
3. What is the relationship of %rostertitle% to the househol relat
3_oth. Please specify the relationship of %rostertitle% relat_oth
4. In what year was %rostertitle% born? (4-DIGIT) dob_year
5. In what month was %rostertitle% born?MONTH dob_month
age_cur
6. How old is %rostertitle%? age

[B-1] Household Roster - Basic Information

1. WebTester (online tester) allows going through the questionnaire, answering questions, following the skips and verifying the error checks.
2. Does not require a tablet, works in the browser. Performance may differ compared to a real tablet experience.
3. Doesn't show values of calculated variables.
4. Doesn't indicate responsiveness.

Online Tester for CAWI

After clicking on the Test button at the top of the page a new window/tab will open with your questionnaire.


63-09-59-91
Household Roster SAMPLE
Original
Help
[B-1] Household Roster - Basic Information
[B-2] Household Roster - Member Details
Complete
Enter new item
[B-2] HOUSEHOLD ROSTER - MEMBER DETAILS

[B-1] Household Roster - Basic Information

1. NAME

MAKE A COMPLETE LIST OF ALL INDIVIDUALS WHO NORMALLY LIVE AND EAT THEIR MEALS TOGETHER IN THIS HOUSEHOLD, STARTING WITH THE HEAD OF HOUSEHOLD.

Tester tools

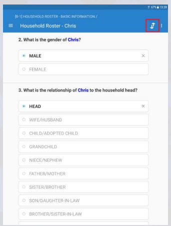
➢ Since Survey Solutions Tester doesn't send the input to a data server (though it can save scenario data, that data may not be exported), it may **not be used to collect data**.

➢ Make sure the interviewers do not have the tester application installed on the tablets used for data collection. The two applications may be easily confused!

➢ Since Survey Solutions Tester can give an indication of how long does it take to re-evaluate all the conditions following a new answer (enable this mode in the settings). The value is measured and reported in msec.

Refreshing the questionnaire

- ➢ Both, the Survey Solutions Tester app and the web tester provide a possibility to refresh the questionnaire while holding the current input. To reload the questionnaire, click on the button at the top right with two arrows to reload the questionnaire.
- ➢ Use this when testing large questionnaires, where repeating the test input may take significant time.
- ➢ If the changes have made the input impossible to accommodate, will need to start populating the questionnaire from the very beginning.



[B-1] HOUSEHOLD ROSTER - BASIC INFORMATION /

Household Roster - Chris

2. What is the gender of Chris?

● MALE ×

○ FEMALE

3. What is the relationship of Chris to the household head?

● HEAD ×

○ WIFE/HUSBAND

○ CHILD/ADOPTED CHILD

○ GRANDCHILD

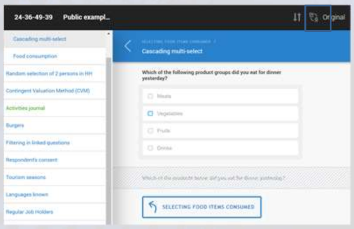
○ NIECE/NEPHEW

○ FATHER/MOTHER

○ SISTER/BROTHER

○ SON/DAUGHTER-IN-LAW

○ BROTHER/SISTER-IN-LAW



24-36-49-39 Public exampl...

Original

Cascading multi-select

Food consumption

Random selection of 2 persons in HH

Contingent Valuation Method (CVM)

Activities journal

Burgers

Filtering in linked questions

Respondent's consent

Tourism seasons

Languages known

Regular Job Holders

SELECTING FOOD ITEMS CONSUMED /

Cascading multi-select

Which of the following product groups did you eat for dinner yesterday?

□ Meats

□ Vegetables

□ Fruits

□ Drinks

Which of the products below did you eat for dinner yesterday?

SELECTING FOOD ITEMS CONSUMED

Live demo: Example survey

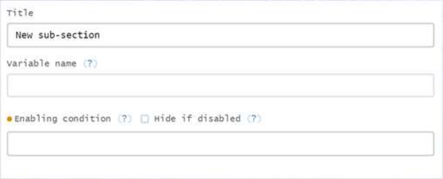
Questions

1. What app should we use to test a questionnaire for CAPI survey?
2. What app should we use to test a questionnaire for CAWI survey?
3. How to check a questionnaire for critical errors?
4. Is presentation of all questions in both tools the same? If no, what is the difference?
5. What should you check before reloading the questionnaire on a tester?
6. What color scheme is used in testers tools? What is the meaning behind it?
7. Compile the questionnaire that you have created and after Test the questionnaire with both Tester tools.

Basic questions' types and their properties

Survey Solutions
Designer

Properties of containers



Title
New sub-section

Variable name (?)

Enabling condition (?) □ Hide if disabled (?)

Containers are Sections and Sub-section. Their properties are:

1. **Title**.
2. **Variable name**. A variable name (an identifier) must be assigned to every question, calculated variable, and roster in Survey Solutions. Additionally it must also be assigned to the whole questionnaire, and may be assigned to sections and subsections.
3. **Enabling conditions** are the Survey Solutions equivalents of skip patterns in paper-based questionnaires. By using conditions you can enable or disable certain questions based on the answers a respondent has given in previous questions.

Variable names

Variable name (?)
age

1. Variable names are used for:
   - ➢referring to questions in the C# syntax expressions;
   - ➢naming the data columns in the export data files;
   - ➢referring to the origin of event in paradata events, errors and comments files.
2. A variable name is a word that consists only of the following:
   - ➢English letters A..Z and a..z;
   - ➢Digits 0..9;
   - ➢an underscore character "_".
3. Variable names may not be longer than 32 characters and are required to be shorter for some question types (20 characters): multiselect, GPS location and some other question types.

Variable names: naming conventions

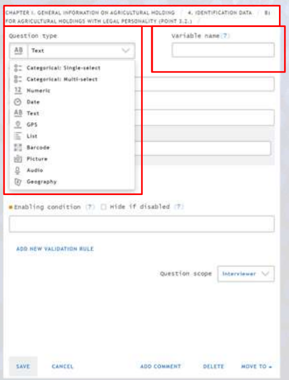
Variable name (?)
age

The following are some common schemes for naming variables in questionnaires:

- ➢*v1, v2, v3* (by question number);
- ➢*s1q1, s1q2, .., s2q1,….* (by section and question number);
- ➢*a1, a2, …b1, b2* (by section letter and question number);
- ➢*age, gender, education* (by the matter of the question);
- ➢*ageOfHead, numberOfChildren* (so called Camel notation);
- ➢*AgeOfHead, NumberOfChildren* (capitalization of every variable name);
- ➢*age_of_head, number_of_children* (underscores used to separate words).

Once you've picked a convention for the variable names, it's best to maintain it for the whole questionnaire and inform your collaborators about your preferred pattern of variable names.

Properties of a question



CHAPTER I. GENERAL INFORMATION ON AGRICULTURAL HOLDING / 4. IDENTIFICATION DATA / B) FOR AGRICULTURAL HOLDINGS WITH LEGAL PERSONALITY (POINT 3.2.) /

Question type: Text

Variable name (?)

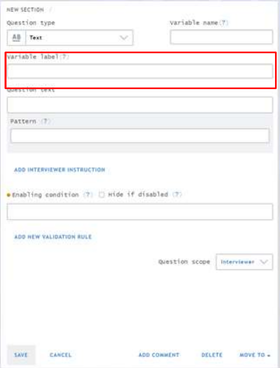
Enabling condition (?) □ Hide if disabled (?)

Question scope: Interviewer

Properties of a new question:

1. **Question type**. The expected answer type determines the question type to use;
2. **Variable name**.

Properties of a question



NEW SECTION /

Question type: Text

Variable name (?)

Variable label (?)

Question text

Pattern (?)

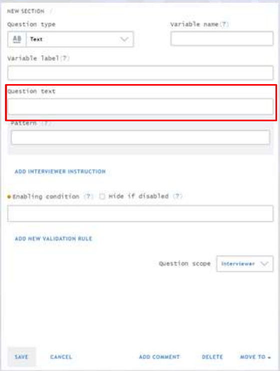
Enabling condition (?) □ Hide if disabled (?)

Question scope: Interviewer

Properties of a new question:

1. **Question type;**
2. **Variable name;**
3. **Variable label** is the description of the data captured by the question and it will be associated with the variable name when exporting the data to a statistical software package. If the variable label is not specified, the question text is automatically used as the variable label. As it is not needed during the interview, the variable label is not visible for an interviewers.

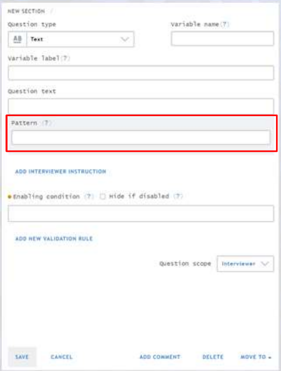
Properties of a question



Properties of a new question:

1. **Question type;**
2. **Variable name;**
3. **Variable label;**
4. **Question text** contains the text that the enumerator should read to the respondent. Therefore, it is suggested to use regular language when defining the text. The text of the question can be interactive; this means that it can change according to answers given in previous questions.

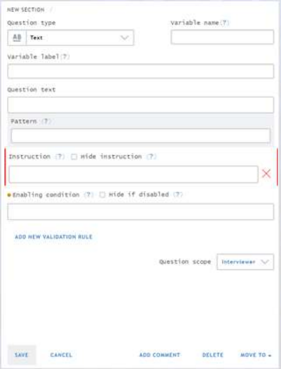
Properties of a question



Properties of a new question:

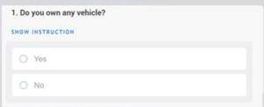
1. **Question type;**
2. **Variable name;**
3. **Variable label;**
4. **Question text;**
5. **Type specific properties.**

Properties of a question

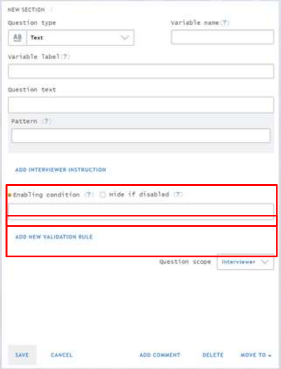


Properties of a new question:

1. **Question type;**
2. **Variable name;**
3. **Variable label;**
4. **Question text;**
5. **Type specific properties;**
6. **Instruction.** For each question, you can add **instructions** to be read by the enumerator while conducting the interview.
   To add interviewer instructions, click on the Add Interviewer instructions link. Add the text in the field.


1. Do you own any vehicle?

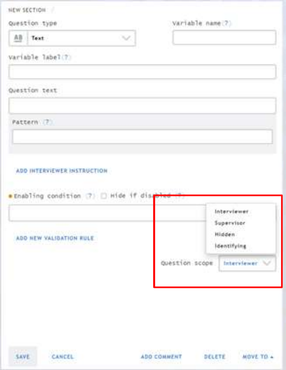
Properties of a question



Properties of a new question:

1. **Question type;**
2. **Variable name;**
3. **Variable label;**
4. **Question text;**
5. **Type specific properties;**
6. **Instruction;**
7. **Enabling condition.**
8. **Validation conditions** are created similarly to enabling conditions. Instead of evaluating whether the question should be displayed, it determines whether the answer given by the interviewee is acceptable.

Properties of a question



Properties of a new question:

1. **Question type;**
2. **Variable name;**
3. **Variable label;**
4. **Question text;**
5. **Type specific properties;**
6. **Instruction;**
7. **Enabling condition;**
8. **Validation conditions;**
9. **Question Scope** of a question defines who will be responsible for answering it.
   When the scope *HIDDEN* is selected, the question is destined to be hidden and store the prefilled values to be used in validations and enabling conditions.
   When **identifying** scope is selected, the question appears as a case identifier on the dashboards of interviewers, supervisors, and headquarters. Most often, the questions concern the location and identity of interview cases--for example, region, village, and enumeration area where the household lives.

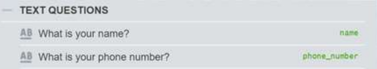
Question scope: Live demo (Identifying questions quest.)

Questions

1. What characters could be used in Variable names?
2. What are Variable names used for?
3. How you can identify what is the question type of questions in a section content?
4. What does it mean if property of a question is in a gray block?
5. How to add an Instruction to a question?
6. What question scopes are visible for an interviewer?

COMPONENTS

Sub-sections



TEXT QUESTIONS

AB What is your name? name

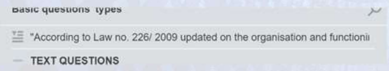
AB What is your phone number? phone_number

➢Sub-sections can contain one or more static-texts, questions, other sub-sections and rosters.

➢They are used to group a set of questions related to a specific topic. For instance in household surveys a subsection can be used to group the questions related to the household's characteristics.

➢Questions within a sub-section are only asked once in an interview.

Static text



Basic questions types

"According to Law no. 226/ 2009 updated on the organisation and functioni

TEXT QUESTIONS

Static text:

➢is not a question;

➢can be added wherever a question can be added;

➢may be formatted;

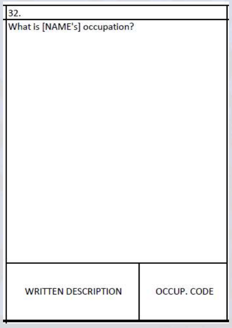
➢may contain images;

➢may be conditional;

➢may be validated.

Text question

Text questions on a paper

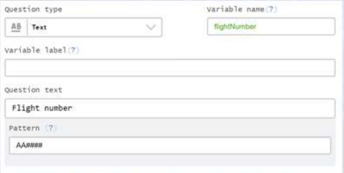


32.
What is [NAME's] occupation?

WRITTEN DESCRIPTION	OCCUP. CODE

Text questions are most universal type of question: anything that respondent can tell us during an interview can be captured as text;

Text question: Pattern



Question type: AB Text

Variable name (?): flightNumber

Variable label (?):

Question text: Flight number

Pattern (?): AA####

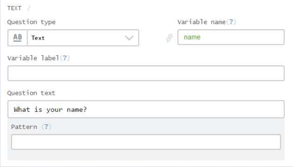
If you know the format of the expected answer use the ***Pattern*** field to define a specific format for the answer, otherwise leave this field blank.

Patterns	Represent
~	One alpha character (A-Z,a-z)
#	One numeric character (0-9)
*	One alphanumeric character (A-Z,a-z,0-9)
~*-###-~###	Id code
(###)-###-####	Phone number

Note that:
•pattern enforces fixed length of content;
•pattern enforces "hard" validation.

Text questions

Text question with no restrictions


TEXT /

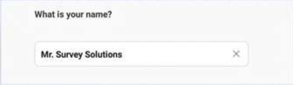
Question type: AB Text

Variable name(?): name

Variable label(?):

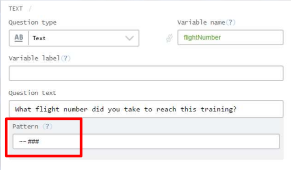
Question text: What is your name?

Pattern (?):


What is your name?

Mr. Survey Solutions

Text question with pattern


TEXT /

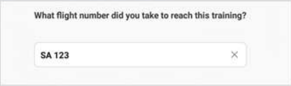
Question type: AB Text

Variable name(?): flightNumber

Variable label(?):

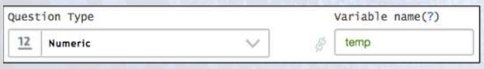
Question text: What flight number did you take to reach this training?

Pattern (?): ~~###


What flight number did you take to reach this training?

SA 123

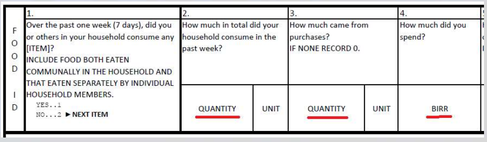
Numeric question


Question Type: 12 Numeric

Variable name(?): temp

- ➢A numeric question expects an answer to contain numeric characters (0-9).
- ➢A numeric question can be Integer or Decimal.
- ➢When number of decimal places field is blank the maximum number of decimal places assigned by the system could be entered.
- ➢Answers can be formatted to language specific thousands and decimal separator.

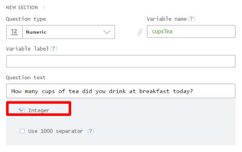
Numeric questions on a paper



F O O D I D	1.	2.		3.		4.
	Over the past one week (7 days), did you or others in your household consume any [ITEM]? INCLUDE FOOD BOTH EATEN COMMUNALLY IN THE HOUSEHOLD AND THAT EATEN SEPARATELY BY INDIVIDUAL HOUSEHOLD MEMBERS. YES..1 NO...2 ► NEXT ITEM	How much in total did your household consume in the past week?		How much came from purchases? IF NONE RECORD 0.		How much did you spend?
		QUANTITY	UNIT	QUANTITY	UNIT	BIRR

Numeric question

Integer


NEW SECTION /

Question type: 12 Numeric

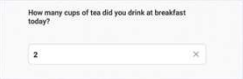
Variable name(?): cupsTea

Variable label(?):

Question text: How many cups of tea did you drink at breakfast today?

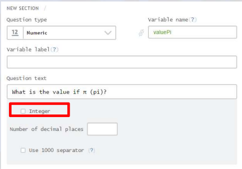
☑ Integer

□ Use 1000 separator (?)


How many cups of tea did you drink at breakfast today?

2

Decimal


NEW SECTION /

Question type: 12 Numeric

Variable name(?): valuePi

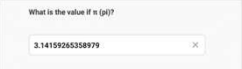
Variable label(?):

Question text: What is the value if π (pi)?

□ Integer

Number of decimal places:

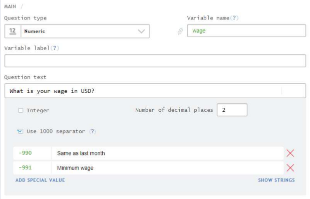
□ Use 1000 separator (?)


What is the value if π (pi)?

3.14159265358979

Numeric question: Special values

Numeric questions may be enhanced with special values. For example, a numeric wage question may contain in addition to a numeric input, a selection of "*minimum wage*" and "*last month's wage*" categories. They can be set up in the Designer by entering integer numeric codes and corresponding value labels:


MAIN /

Question type: 12 Numeric

Variable name(?): wage

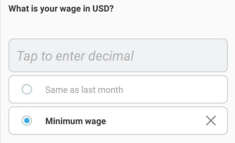
Variable label(?):

Question text: What is your wage in USD?

□ Integer   Number of decimal places: 2

☑ Use 1000 separator (?)

-990	Same as last month
-991	Minimum wage


What is your wage in USD?

Tap to enter decimal

○ Same as last month

● Minimum wage

Numeric question: Special values

If the user enters a numeric value that happens to be a special value code, the corresponding special value option will be selected automatically on entry.

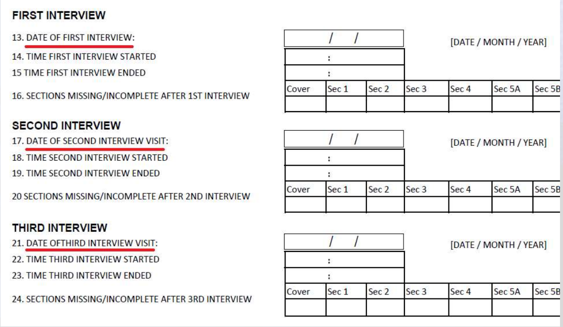
Special values are stored as codes and are exported in the same numeric variable, with labels defined in file formats that support value labels.

Note: the special values feature may be used to accommodate the common situations with capturing "*Refusal*", "*Don't know*", and similar.

However, when such a special value is selected the question will be counted as answered, and the answer to the question will be treated as non-missing during the expressions evaluation

Date question

Date questions on a paper



FIRST INTERVIEW

13. DATE OF FIRST INTERVIEW: /   /   [DATE / MONTH / YEAR]

14. TIME FIRST INTERVIEW STARTED   :

15 TIME FIRST INTERVIEW ENDED   :

16. SECTIONS MISSING/INCOMPLETE AFTER 1ST INTERVIEW

Cover	Sec 1	Sec 2	Sec 3	Sec 4	Sec 5A	Sec 5B

SECOND INTERVIEW

17. DATE OF SECOND INTERVIEW VISIT: /   /   [DATE / MONTH / YEAR]

18. TIME SECOND INTERVIEW STARTED   :

19. TIME SECOND INTERVIEW ENDED   :

20 SECTIONS MISSING/INCOMPLETE AFTER 2ND INTERVIEW

Cover	Sec 1	Sec 2	Sec 3	Sec 4	Sec 5A	Sec 5B

THIRD INTERVIEW

21. DATE OFTHIRD INTERVIEW VISIT: /   /   [DATE / MONTH / YEAR]

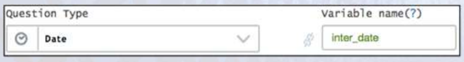
22. TIME THIRD INTERVIEW STARTED   :

23. TIME THIRD INTERVIEW ENDED   :

24. SECTIONS MISSING/INCOMPLETE AFTER 3RD INTERVIEW

Cover	Sec 1	Sec 2	Sec 3	Sec 4	Sec 5A	Sec 5B

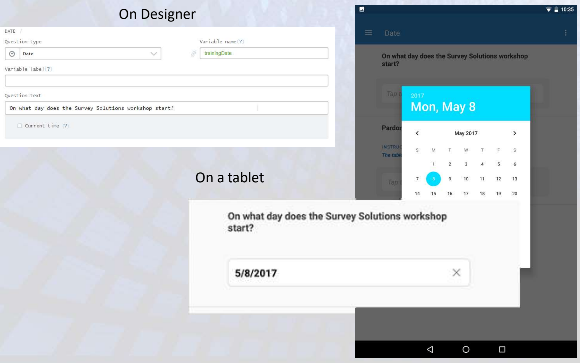
Date question


Question Type: Date
Variable name(?): inter_date

➢Date question can be used to capture date of the visit, beginning of section, end of section, birthday, marriage, etc.

➢A date question expects a date from the Gregorian calendar as an answer.

Date question


On Designer

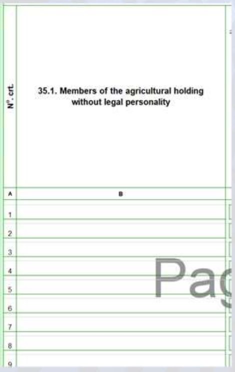
DATE /
Question type: Date
Variable name(?): trainingDate
Variable label(?)
Question text: On what day does the Survey Solutions workshop start?
□ Current time (?)

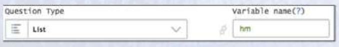
On a tablet

On what day does the Survey Solutions workshop start?

5/8/2017

List question


N°. crt.
35.1. Members of the agricultural holding without legal personality
A
B
1
2
3
4
5
6
7
8
9
Pag


Question Type: List
Variable name(?): hm

➢ A list question expects an open list of answers.

➢Each answer can contain alphanumeric characters (A-Z, a-z,0-9) and basic punctuation symbols.

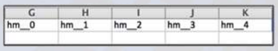
By default the enumerator can add up to 200 items with exceptions; however you can limit the number of items defining the maximum number of answers.

List question

Export

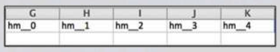
The listed answers are exported in text variables in a tab-delimited file. The system creates as many variables (columns in tab-delimited file) as the total number of possible answers. For example, if the maximum number of answers has been defined as 5, then there will be 5 variables in the tab-delimited file. If the maximum number of answers has not been defined, the system will automatically create maximum number of variables for the question.

Unanswered question exported in tab-delimited file



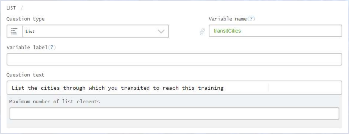
G	H	I	J	K
hm__0	hm__1	hm__2	hm__3	hm__4

Answered question exported in tab-delimited file



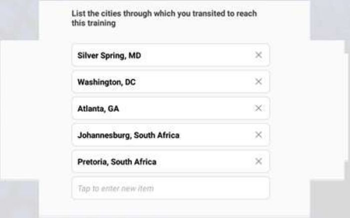
G	H	I	J	K
hm__0	hm__1	hm__2	hm__3	hm__4

List question


LIST /
Question type: List
Variable name(?): transitCities
Variable label(?)
Question text: List the cities through which you transited to reach this training
Maximum number of list elements

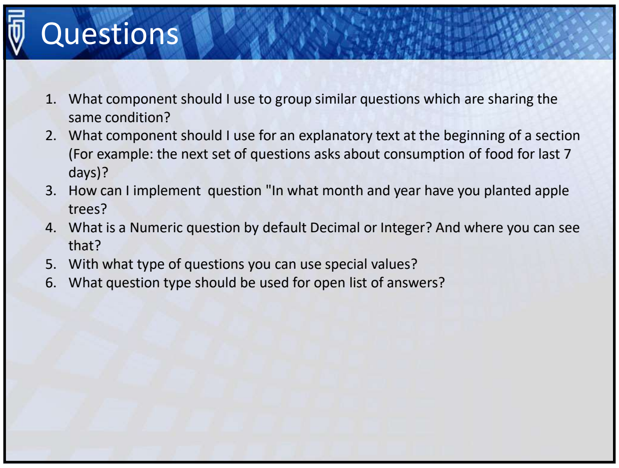
On Designer

On a tablet


List the cities through which you transited to reach this training

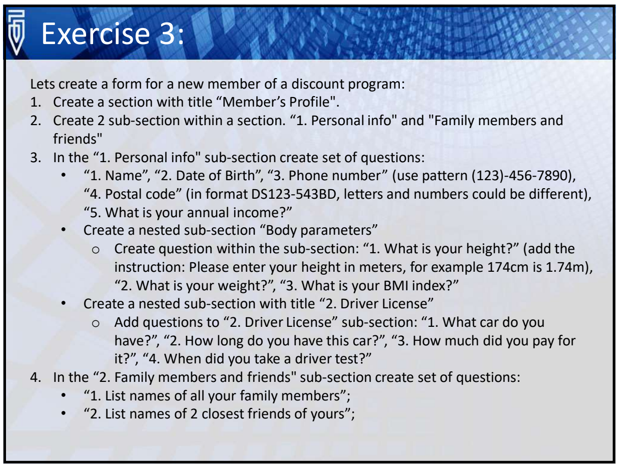
- Silver Spring, MD
- Washington, DC
- Atlanta, GA
- Johannesburg, South Africa
- Pretoria, South Africa
- Tap to enter new item

Live demo: Basic questions



Questions

1. What component should I use to group similar questions which are sharing the same condition?
2. What component should I use for an explanatory text at the beginning of a section (For example: the next set of questions asks about consumption of food for last 7 days)?
3. How can I implement question "In what month and year have you planted apple trees?
4. What is a Numeric question by default Decimal or Integer? And where you can see that?
5. With what type of questions you can use special values?
6. What question type should be used for open list of answers?



Exercise 3:

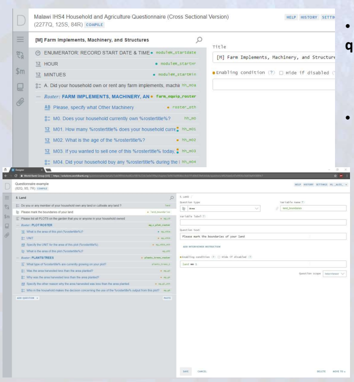
Lets create a form for a new member of a discount program:

1. Create a section with title “Member’s Profile".
2. Create 2 sub-section within a section. “1. Personal info" and "Family members and friends"
3. In the “1. Personal info" sub-section create set of questions:
   - “1. Name”, “2. Date of Birth”, “3. Phone number” (use pattern (123)-456-7890), “4. Postal code” (in format DS123-543BD, letters and numbers could be different), “5. What is your annual income?”
   - Create a nested sub-section “Body parameters”
     - Create question within the sub-section: “1. What is your height?” (add the instruction: Please enter your height in meters, for example 174cm is 1.74m), “2. What is your weight?”, “3. What is your BMI index?”
   - Create a nested sub-section with title “2. Driver License”
     - Add questions to “2. Driver License” sub-section: “1. What car do you have?”, “2. How long do you have this car?”, “3. How much did you pay for it?”, “4. When did you take a driver test?”
4. In the “2. Family members and friends" sub-section create set of questions:
   - “1. List names of all your family members”;
   - “2. List names of 2 closest friends of yours”;

Survey Solutions Design Tools

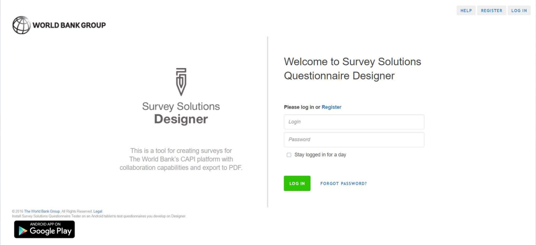
Survey Solutions
Designer

What is Designer?



- **Environment for creating questionnaires**
  - ✓Create questions
  - ✓Specify skips
  - ✓Dictate quality controls
- **Web application**
  - ✓Yes, an internet connection is needed for its use
  - ✓But a web app brings several advantages
    - ➢Facilitates teamwork
    - ➢Minimizes risk of losing work
    - ➢Benefit from updates and improvements without installation
    - ➢Available on any device

Where to find it



WORLD BANK GROUP

HELP REGISTER LOG IN

Survey Solutions
Designer

This is a tool for creating surveys for The World Bank's CAPI platform with collaboration capabilities and export to PDF.

Welcome to Survey Solutions Questionnaire Designer

Please log in or Register

Login

Password

□ Stay logged in for a day

LOG IN FORGOT PASSWORD?

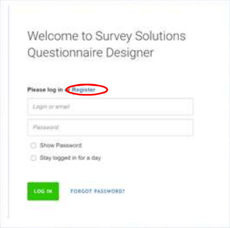
© 2016 The World Bank Group, All Rights Reserved. Legal
Install Survey Solutions Questionnaire Tester on an Android tablet to test questionnaires you develop on Designer.

ANDROID APP ON Google Play

https://designer.mysurvey.solutions/

How to access

https://designer.mysurvey.solutions/



Welcome to Survey Solutions Questionnaire Designer

Please log in or Register

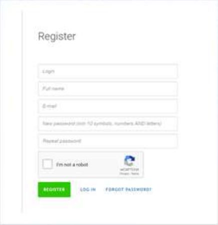
Login or email

Password

□ Show Password

□ Stay logged in for a day

LOG IN FORGOT PASSWORD?



Register

Login

Full name

E-mail

New password (min 10 symbols, numbers AND letters)

Repeat password

□ I'm not a robot

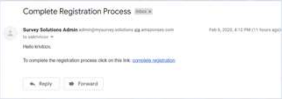
REGISTER LOG IN FORGOT PASSWORD?

User has to have an account to login into the system.

If you don't have an account just fill in the simple registration form. Be aware that it requires an email.

How to access

https://designer.mysurvey.solutions/



Complete Registration Process

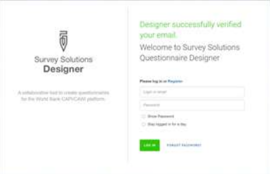
Survey Solutions Admin

Hello

To complete the registration process click on this link: complete registration

Reply Forward

You will get Email notification. To complete registration click on the link.



Survey Solutions
Designer

Designer successfully verified your email.

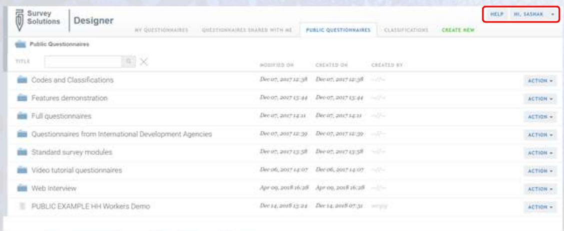
Welcome to Survey Solutions Questionnaire Designer

Please log in or Register

LOG IN FORGOT PASSWORD?

After Successful verification you can login under your credentials.

The home page



Survey Solutions | Designer

HELP HI, SASHAK

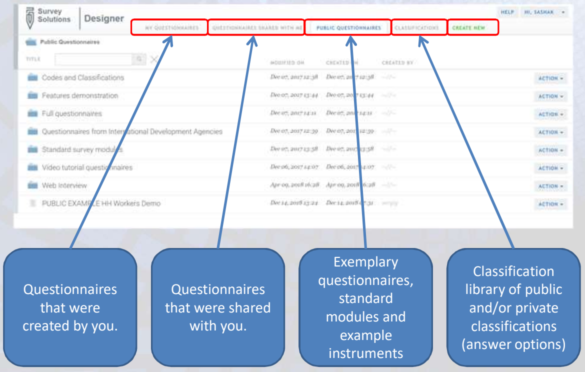
MY QUESTIONNAIRES | QUESTIONNAIRES SHARED WITH ME | PUBLIC QUESTIONNAIRES | CLASSIFICATIONS | CREATE NEW

Public Questionnaires

TITLE	MODIFIED ON	CREATED ON	CREATED BY	
Codes and Classifications	Dec 07, 2017 12:38	Dec 07, 2017 12:38	--/--	ACTION
Features demonstration	Dec 07, 2017 13:44	Dec 07, 2017 13:44	--/--	ACTION
Full questionnaires	Dec 07, 2017 14:11	Dec 07, 2017 14:11	--/--	ACTION
Questionnaires from International Development Agencies	Dec 07, 2017 12:39	Dec 07, 2017 12:39	--/--	ACTION
Standard survey modules	Dec 07, 2017 13:58	Dec 07, 2017 13:58	--/--	ACTION
Video tutorial questionnaires	Dec 06, 2017 14:07	Dec 06, 2017 14:07	--/--	ACTION
Web Interview	Apr 09, 2018 16:28	Apr 09, 2018 16:28	--/--	ACTION
PUBLIC EXAMPLE HH Workers Demo	Dec 14, 2018 13:24	Dec 14, 2018 07:31	[illegible]	ACTION

1. By pressing **Help button** you can access the Support website where you can find an information about Survey Solutions that your are looking for.
2. By pressing on **Username** you will see pop up which allows you change the password and log out of the system.

Tabs



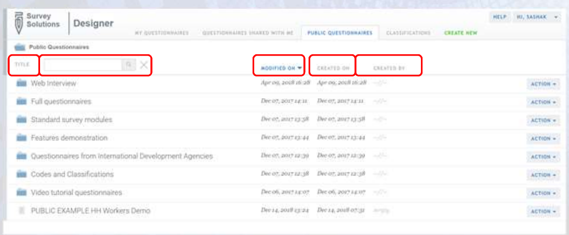
Questionnaires that were created by you.

Questionnaires that were shared with you.

Exemplary questionnaires, standard modules and example instruments

Classification library of public and/or private classifications (answer options)

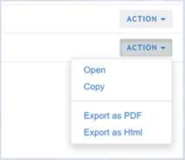
List of questionnaires: Attributes

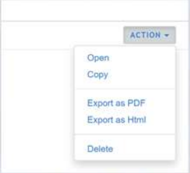


For My Questionnaires, Questionnaires Shared with me, and Public Questionnaires tabs users can **search** through titles of questionnaires.

You can also **sort** every column by clicking on its title.

List of questionnaires: Actions





Click on “Action” button allows you to do some actions:

➢**Open**. Launch the questionnaire editor. You can also open the questionnaire just by clicking on its name.

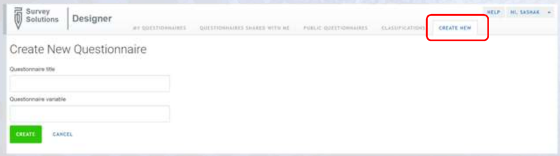
➢**Copy**. Create a clone of the current version of the questionnaire, but with a different name. Copied questionnaires become owned by the person who copied them.

➢**Export as PDF**. Create a PDF version that documents all the details in a format readable by non-experts.

➢**Export as Html**. Create a Html version of the questionnaire.

➢**Delete**. Trash a questionnaire (where you are owner)

Create new questionnaire

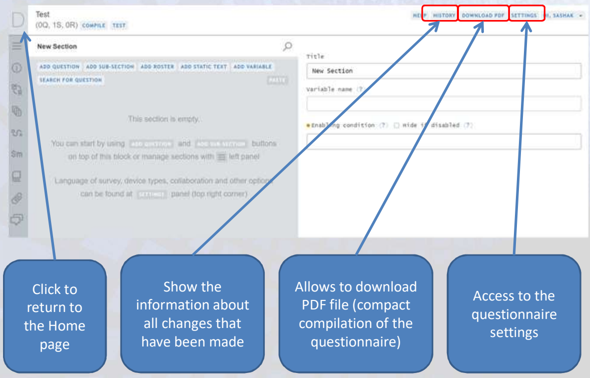


1. click ’create new’ button;
2. provide a mandatory title (keep it short);
3. provide a questionnaire variable name (The Questionnaire variable field is an identifier that will be utilized by Survey Solutions during export of the data for naming the main data file and should follow the same rules as applied to variable names and roster names.).

Questions:

1. How to log out?
2. Where you can change the password?
3. Someone shared a questionnaire with me, where I can find it?
4. I need to present a printed version of my questionnaire. What should I do?
5. I want to copy someone’s questionnaire. Where to go?
6. How to copy a questionnaire?

Questionnaire editor: Top panel



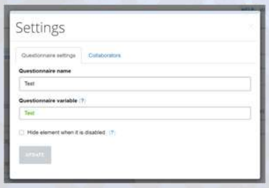
Click to return to the Home page

Show the information about all changes that have been made

Allows to download PDF file (compact compilation of the questionnaire)

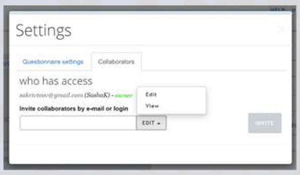
Access to the questionnaire settings

Questionnaire Settings



✓Settings will allow you to update the questionnaire name and/or variable;

✓Hide all elements if they are disabled;


Settings
Questionnaire settings
Collaborators
who has access
sakrivtcov@gmail.com (SashaK) - owner
Edit
View
Invite collaborators by e-mail or login
EDIT
INVITE

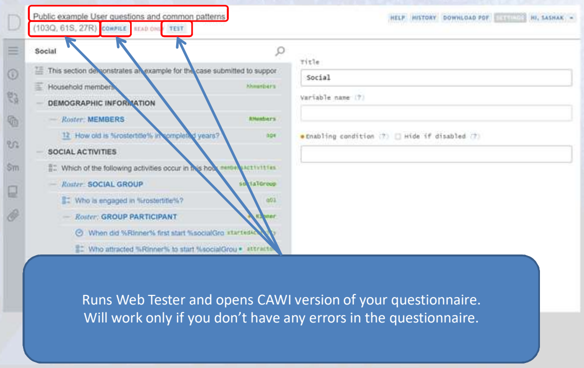
✓You can share the questionnaire with other people.

✓Before sharing, make sure that each person has Designer account and use the email address that the recipient used to sign up for Designer.

Exercise 1

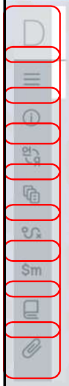
1. Go to the Designer web site https://designer.mysurvey.solutions
2. Login or create a user account
3. Under the user menu, go to "manage your account" and please write down your full name.
4. Create a new questionnaire with name "My questionnaire – (your name)"
5. Share your questionnaire with me, with editor rights. Email for sharing is sakrivtcov@gmail.com
6. Return to the "Home page".

Questionnaire editor


Public example User questions and common patterns
(103Q, 61S, 27R)
COMPILE
READ ONLY
TEST
HELP
HISTORY
DOWNLOAD PDF
SETTINGS
HI, SASHAK
Social
This section demonstrates an example for the case submitted to suppor
Household members
DEMOGRAPHIC INFORMATION
Roster: MEMBERS
How old is %rostertitle% in completed years?
SOCIAL ACTIVITIES
Which of the following activities occur in this hou
Roster: SOCIAL GROUP
Who is engaged in %rostertitle%?
Roster: GROUP PARTICIPANT
When did %Rinner% first start %socialGro
Who attracted %Rinner% to start %socialGrou
Title
Social
Variable name (?)
Enabling condition (?)
□ Hide if disabled (?)

Runs Web Tester and opens CAWI version of your questionnaire.
Will work only if you don't have any errors in the questionnaire.

Panel of Advanced instruments



Back to the Home page button.

Table of contents, an interactive list of all the sections in the questionnaire.

Questionnaire description and survey information, is used to add information about the questionnaire in your export file.

A manager for questionnaire **translations**.

Reusable categories

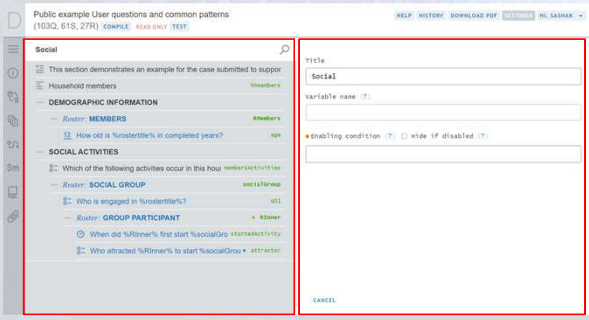
Testing Scenarios

Macros, a panel for defining reusable expressions.

Lookup tables, a compilation of the reference tables.

Attachmens, where images are uploaded so that they can be displayed in the questionnaire.

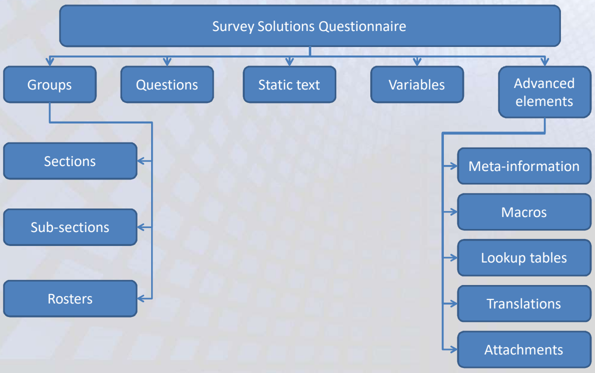
Questionnaire editor


Public example User questions and common patterns
(103Q, 61S, 27R)
COMPILE
READ ONLY
TEST
HELP
HISTORY
DOWNLOAD PDF
SETTINGS
HI, SASHAK
Social
This section demonstrates an example for the case submitted to suppor
Household members
DEMOGRAPHIC INFORMATION
Roster: MEMBERS
How old is %rostertitle% in completed years?
SOCIAL ACTIVITIES
Which of the following activities occur in this hou
Roster: SOCIAL GROUP
Who is engaged in %rostertitle%?
Roster: GROUP PARTICIPANT
When did %Rinner% first start %socialGro
Who attracted %Rinner% to start %socialGrou
Title
Social
Variable name (?)
Enabling condition (?)
□ Hide if disabled (?)
CANCEL

Content of the current section

Properties of the component

Questionnaire structure



Survey Solutions Questionnaire

Groups

Questions

Static text

Variables

Advanced elements

Sections

Sub-sections

Rosters

Meta-information

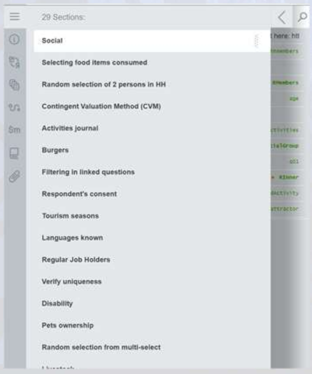
Macros

Lookup tables

Translations

Attachments

Questionnaire components: Sections

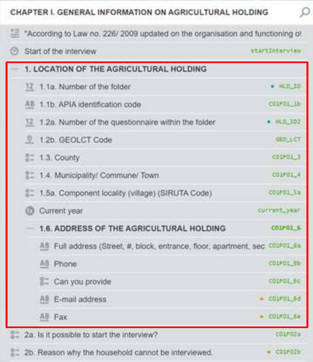


29 Sections:

- Social
- Selecting food items consumed
- Random selection of 2 persons in HH
- Contingent Valuation Method (CVM)
- Activities journal
- Burgers
- Filtering in linked questions
- Respondent's consent
- Tourism seasons
- Languages known
- Regular Job Holders
- Verify uniqueness
- Disability
- Pets ownership
- Random selection from multi-select

Sections are major divisions of a questionnaire, which contain components.
Any questionnaire created with this designer tool consists of sections and must have at least one section.

Questionnaire components: Sub-Sections

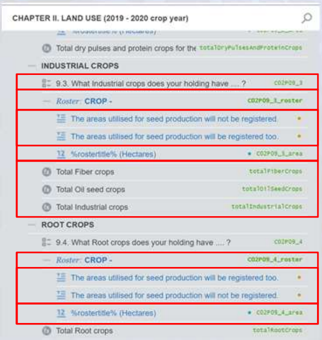


CHAPTER I. GENERAL INFORMATION ON AGRICULTURAL HOLDING

"According to Law no. 226/ 2009 updated on the organisation and functioning of	
Start of the interview	startInterview
1. LOCATION OF THE AGRICULTURAL HOLDING	
1.1a. Number of the folder	HLD_ID
1.1b. APIA identification code	C01P01_1b
1.2a. Number of the questionnaire within the folder	HLD_ID2
1.2b. GEOLCT Code	GEO_LCT
1.3. County	C01P01_3
1.4. Municipality/ Commune/ Town	C01P01_4
1.5a. Component locality (village) (SIRUTA Code)	C01P01_5a
Current year	current_year
1.6. ADDRESS OF THE AGRICULTURAL HOLDING	C01P01_6
Full address (Street, #, block, entrance, floor, apartment, sec	C01P01_6a
Phone	C01P01_6b
Can you provide	C01P01_6c
E-mail address	C01P01_6d
Fax	C01P01_6e
2a. Is it possible to start the interview?	C01P02a
2b. Reason why the household cannot be interviewed.	C01P02b

Sub-sections are groups of questions that are thematically linked or are asked under same conditions.

Questionnaire components: Rosters



CHAPTER II. LAND USE (2019 - 2020 crop year)

Total dry pulses and protein crops for the	totalDryPulsesAndProteinCrops
INDUSTRIAL CROPS	
9.3. What Industrial crops does your holding have .... ?	C02P09_3
Roster: CROP -	C02P09_3_roster
The areas utilised for seed production will not be registered.	
The areas utilised for seed production will be registered too.	
%rostertitle% (Hectares)	C02P09_3_area
Total Fiber crops	totalFiberCrops
Total Oil seed crops	totalOilSeedCrops
Total Industrial crops	totalIndustrialCrops
ROOT CROPS	
9.4. What Root crops does your holding have .... ?	C02P09_4
Roster: CROP -	C02P09_4_roster
The areas utilised for seed production will be registered too.	
The areas utilised for seed production will not be registered.	
%rostertitle% (Hectares)	C02P09_4_area
Total Root crops	totalRootCrops

Rosters are the same set of questions asked about several items

Questions. Text, type of answer, and space to record answer.

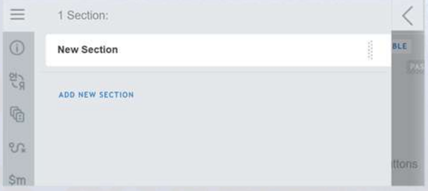
Static text is a questionnaire text not associated with a question.

Variables are computable expressions that can be used to simplify validation and enabling conditions that use complex expressions.

Questions:

1. How to return from a questionnaire editor screen to the home page?
2. Where you can change the name of the questionnaire?
3. Who you can share a questionnaire with?
4. How you can check your questionnaire on critical errors?
5. How to access the table of contents of a questionnaire?
6. What should be your first action in a situation when your questionnaire starts showing errors during the compilation, but you haven't made any changes from the last successful compilation?
7. How do you think why Sections are very important?

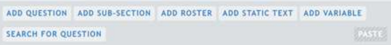
Actions: Create a section



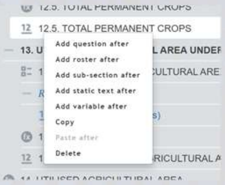
To add a new section, click on the table contents button located at the top left of the screen. A panel showing all the sections within the questionnaire will display. Click on the Add New Section link to add a new section.

Actions: Create a component in a section

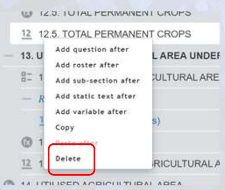
1. Method. Click on a corresponding button to create a component. It locates after the content of a section.



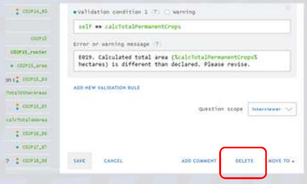
2. Method. Locate a questionnaire component within a section that should precede the new component. Right-click on the component. Add question after, add roster after, add sub-section after, add static text after, add variable after.



Actions: Delete a component

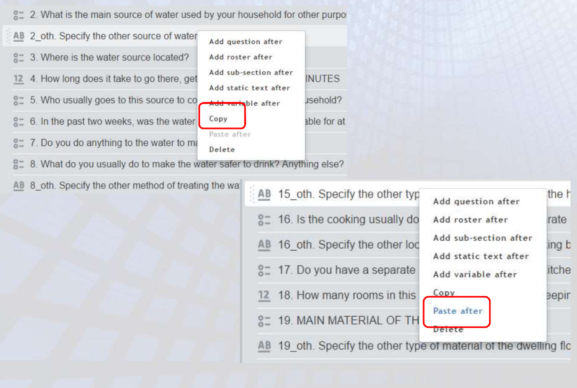


1 Method. Navigate to the section table of contents or the questionnaire table of contents. Right-click on the component you would like to delete. In the pop-link choose delete.

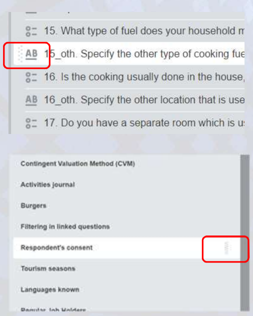

Validation condition 1
Warning
self == calcTotalPermanentCrops
Error or warning message
E019. Calculated total area (%calcTotalPermanentCrops% hectares) is different than declared. Please revise.
ADD NEW VALIDATION RULE
Question scope
Interviewer
SAVE
CANCEL
ADD COMMENT
DELETE
MOVE TO

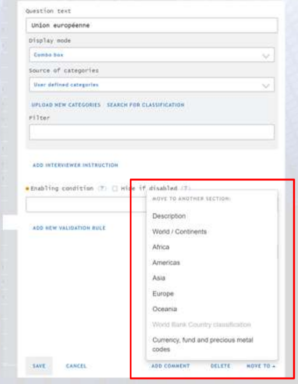
2 Method. Select the component you would like to delete. Click on the DELETE link in the right-hand panel.

Actions: Copy


2. What is the main source of water used by your household for other purpo
2_oth. Specify the other source of water
3. Where is the water source located?
4. How long does it take to go there, get
5. Who usually goes to this source to co
6. In the past two weeks, was the water
7. Do you do anything to the water to ma
8. What do you usually do to make the water safer to drink? Anything else?
8_oth. Specify the other method of treating the wa
Add question after
Add roster after
Add sub-section after
Add static text after
Add variable after
Copy
Paste after
Delete
15_oth. Specify the other typ
16. Is the cooking usually do
16_oth. Specify the other loc
17. Do you have a separate
18. How many rooms in this
19. MAIN MATERIAL OF TH
19_oth. Specify the other type of material of the dwelling flo
Add question after
Add roster after
Add sub-section after
Add static text after
Add variable after
Copy
Paste after
Delete

Actions: Move


15. What type of fuel does your household m
15_oth. Specify the other type of cooking fue
16. Is the cooking usually done in the house,
16_oth. Specify the other location that is use
17. Do you have a separate room which is u
Contingent Valuation Method (CVM)
Activities journal
Burgers
Filtering in linked questions
Respondent's consent
Tourism seasons
Languages known
Regular Job Holders



Exercise 2

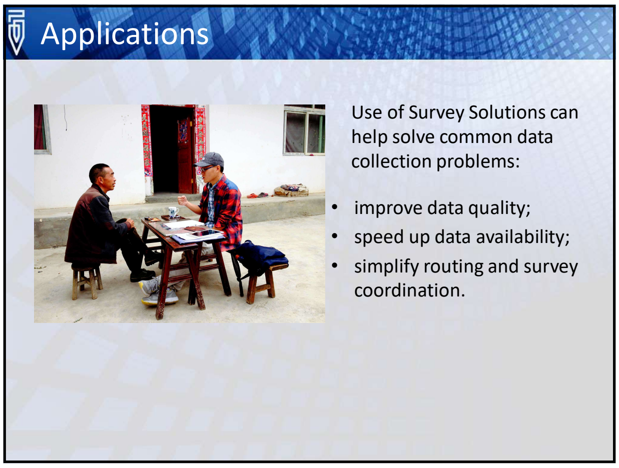
1. Go to the Public Questionnaires, select the Features Demonstration folder, then open the "Public example User questions and common patterns" questionnaire.
2. Find and copy the "Respondent's consent" section.
3. Return to your questionnaire and paste the section as a **section**.
4. Move the "Respondent's consent" section to the top of the table of contents.
5. Add a "New question" and move it to the top of the content list.
6. Move the "New question" to the "New Section"
7. Please find the "Actions with components" questionnaire in Public Questionnaires and copy the Vehicle section.
8. Paste the Vehicle section to the New section as a sub-group.
9. Arrange questions in a numeric order.

Survey Solutions: Overview

Oleksandr Krivtsov, Sergiy Radyakin
February, 2020

Survey solutions

Survey Solutions is a free software for data collection and survey management developed in the Data group of The World Bank.



Applications

Use of Survey Solutions can help solve common data collection problems:

- improve data quality;
- speed up data availability;
- simplify routing and survey coordination.

Applications

Survey Solutions provides rich functionality for planning, design and implementation of surveys and is suitable for surveys of all types:

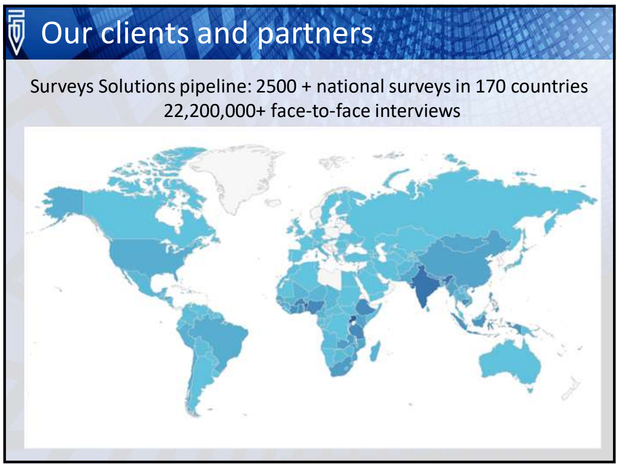
✓household income and budget surveys,

✓labor force surveys,

✓agricultural surveys,

✓health surveys,

✓enterprise surveys, etc.



Our clients and partners

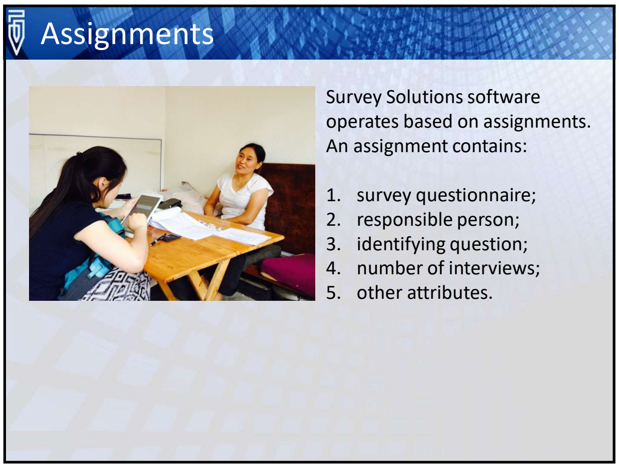
Surveys Solutions pipeline: 2500 + national surveys in 170 countries
22,200,000+ face-to-face interviews

Our clients and partners

Our clients and partners are National Statistical Offices, NGOs, Universities, Think Tanks, Private firms and e.c..

Components and Roles

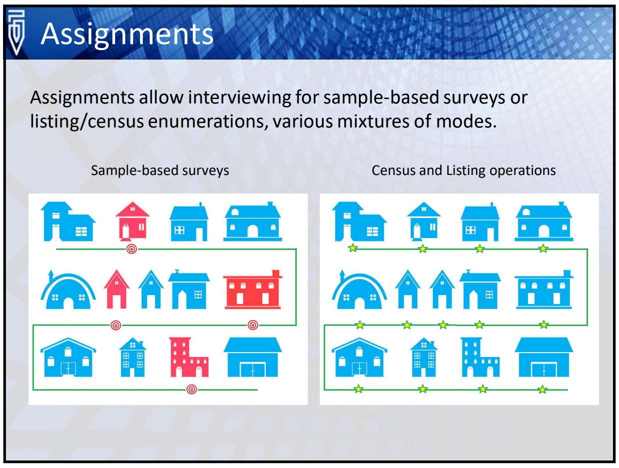
- ✓ Designer;
- ✓ Tester;
- ✓ Headquarter;
- ✓ Interviewer;
- ✓ Supervisor;
- ✓ Administrator;
- ✓ Observer.



Assignments

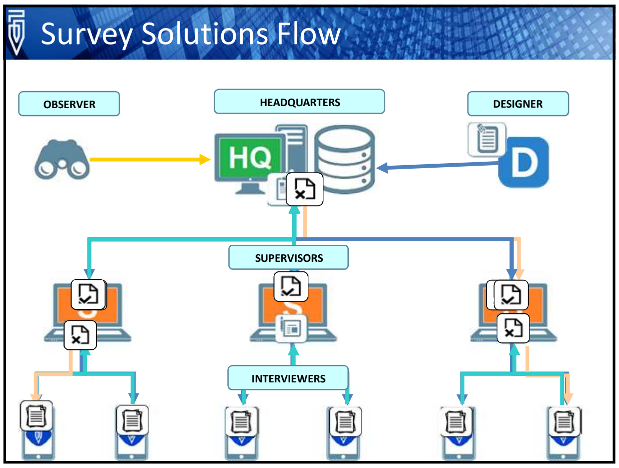
Survey Solutions software operates based on assignments. An assignment contains:

1. survey questionnaire;
2. responsible person;
3. identifying question;
4. number of interviews;
5. other attributes.

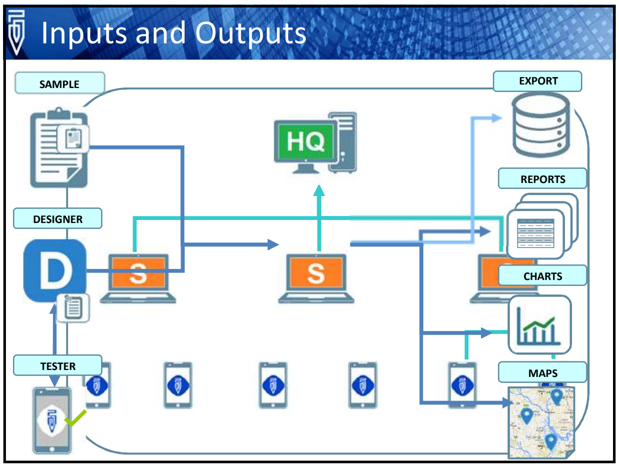


Assignments

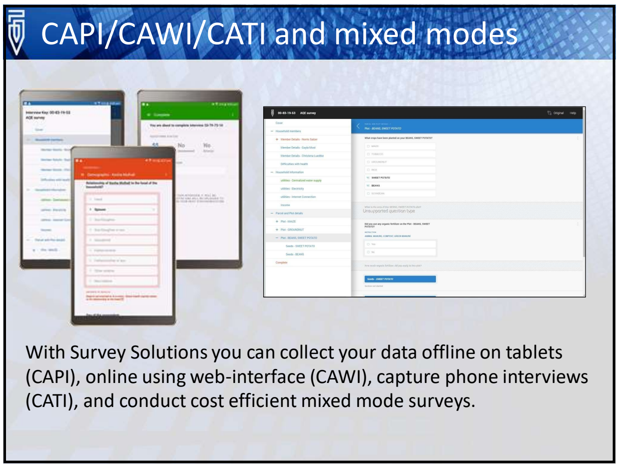
Assignments allow interviewing for sample-based surveys or listing/census enumerations, various mixtures of modes.



Survey Solutions Flow



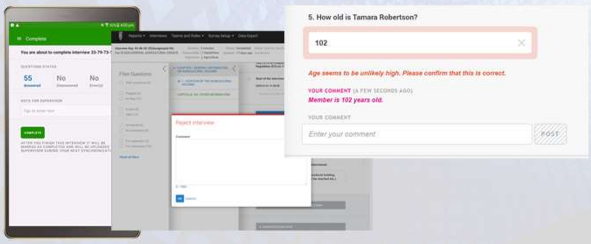
Inputs and Outputs



CAPI/CAWI/CATI and mixed modes

With Survey Solutions you can collect your data offline on tablets (CAPI), online using web-interface (CAWI), capture phone interviews (CATI), and conduct cost efficient mixed mode surveys.

Commentaries



5. How old is Tamara Robertson?

102

Age seems to be unlikely high. Please confirm that this is correct.

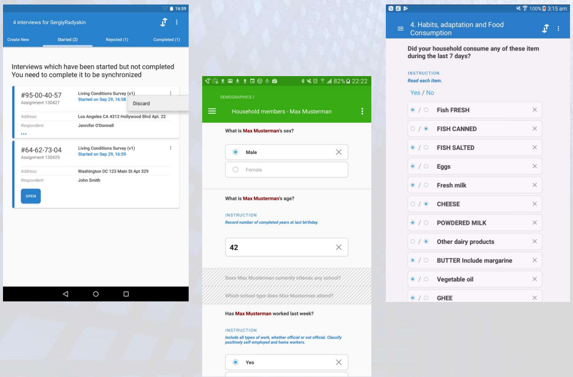
YOUR COMMENT (A FEW SECONDS AGO)
Member is 102 years old.

YOUR COMMENT
Enter your comment

- Throughout the data collection, interviewers and supervisors can use the rich commenting features to exchange notes and requests about the data being collected, and Survey Solutions keeps track of all such communication for audit, training, and quality assurance.

•Commentaries may be question-specific or questionnaire-specific.
•Exported with data, available for analysis after the survey.

Intuitive User Interface



4 interviews for SergiyRadyakin

Interviews which have been started but not completed
You need to complete it to be synchronized

#95-00-40-57
Assignment 130427
Living Conditions Survey (v1)
Started on Sep 29, 16:58

Address: Los Angeles CA 4312 Hollywood Blvd Apt. 22
Respondent: Jennifer O'Donnell

#64-62-73-04
Assignment 130425
Living Conditions Survey (v1)
Started on Sep 29, 16:59
Address: Washington DC 123 Main St Apt 329
Respondent: John Smith

DEMOGRAPHICS /
Household members - Max Musterman

What is Max Musterman's sex?
● Male
○ Female

What is Max Musterman's age?
INSTRUCTION
Record number of completed years at last birthday.
42

Does Max Musterman currently attends any school?
Which school type does Max Musterman attend?

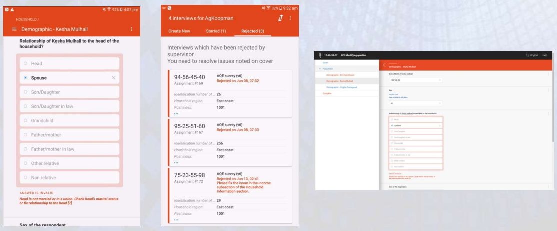
Has Max Musterman worked last week?
INSTRUCTION
Include all types of work, whether official or not official. Classify positively self-employed and home workers.
● Yes

4. Habits, adaptation and Food Consumption

Did your household consume any of these item during the last 7 days?
INSTRUCTION
Read each item.
Yes / No

● / ○	Fish FRESH
○ / ●	FISH CANNED
● / ○	FISH SALTED
● / ○	Eggs
● / ○	Fresh milk
○ / ●	CHEESE
● / ○	POWDERED MILK
○ / ●	Other dairy products
● / ○	BUTTER Include margarine
● / ○	Vegetable oil
● / ○	GHEE

Control quality of your data



Survey Solutions allows you to validate your answers and direct the interview flow; use macros, calculated variables and lookup tables to construct sophisticated data validation algorithms.

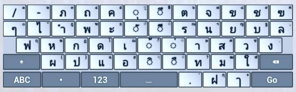
Connectivity

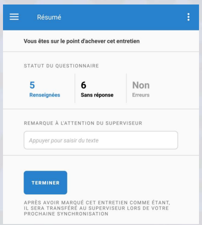
Internet connection is not required during the interview in CAPI mode in the household.

Survey Solutions allows interviewing to be done offline, and the data is synchronized to the remote server when the connection becomes available.

Global Solutions

Writing questions text, options, instructions, error messages in any language/script included in Unicode.





Résumé

Vous êtes sur le point d'achever cet entretien

STATUT DU QUESTIONNAIRE

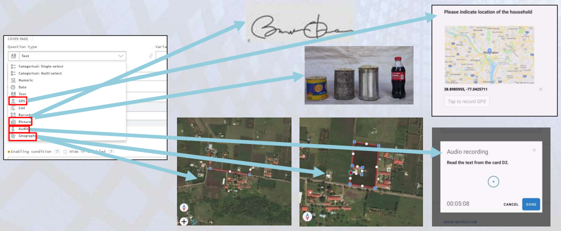
5	6	Non
Renseignées	Sans réponse	Erreurs

REMARQUE À L'ATTENTION DU SUPERVISEUR
Appuyer pour saisir du texte

APRÈS AVOIR MARQUÉ CET ENTRETIEN COMME ÉTANT, IL SERA TRANSFÉRÉ AU SUPERVISEUR LORS DE VOTRE PROCHAINE SYNCHRONISATION

Multiple translations can be prepared by the designer for the same questionnaire, interviewers and supervisors can then switch between them at will.

Capture any type of data with ease



With Survey Solutions you can design your surveys with a full range of standard and novel questions, utilize nested rosters and answer piping, cascading and linked questions and record information from external sensors.

Novel Question Types

- Novel question types allow capturing information that goes beyond pen and paper, and let the interviewers capture:
  - ✓ Location of the interview;
  - ✓ Map based area estimation;
  - ✓ Audio recording;
  - ✓ Images (of a house, person, document, product and e.c.);
  - ✓ Scan barcodes of various types;

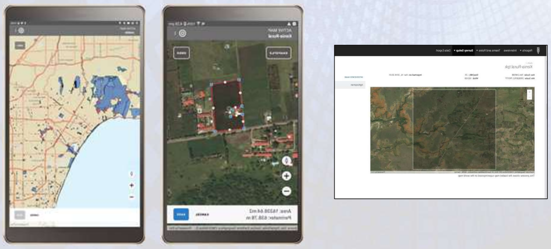
https://mysurvey.solutions

- Cascading selections narrow down the choices for the interviewer;
- Linked questions surve the information captured already in different part of the questionnaire: for example \who is the biological mother of John Smith?", \Who makes decisions on large purchases?"

Rosters

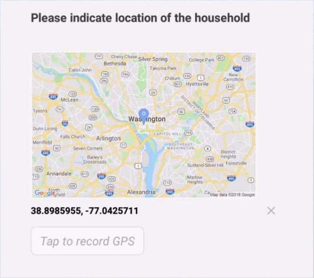
- Questions replication with rosters allow repetition of same questions to each household member or company employee.
- And the validation logic and skips will be automatically replicated too.
- Four types of rosters: fixed, or dynamic, triggered by numeric, multiple choice, or list questions.
- Rosters allow data collection in multiple levels of hierarchy, especially important for agricultural surveys with questions on multiple plots and crops. They can be implemented with nested rosters available in Survey Solutions!

GIS



With SuSo you can collect detailed GIS information on locations, distances, and areas, apply geofencing and guide interviewers to the point of interview offline using high resolution satellite images and built-in GPS receivers.

Connectivity GPS

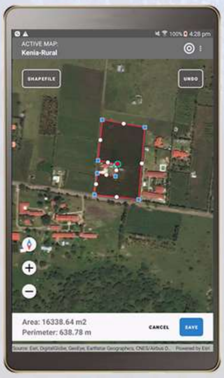


Please indicate location of the household

38.8985955, -77.0425711

Internet connection is not required for recording location of the households with GPS.

Offline maps



Area: 16338.64 m2
Perimeter: 638.78 m

Open Data and Useful Metadata

✓Survey Solutions exports data in tab-delimited data format, which is understood by virtually any major statistical package, spreadsheet or database management application.

✓Data can also be exported for use with Stata and SPSS statistical packages in their native binary formats.

✓Data preloading and creation of assignments in an automatic mode allow facilitation of large surveys and especially panel surveys with ease.

Paradata

- ✓logging information on interview status changes;
- ✓logging individual changes to the interview with timestamps
- ✓ supplement with the GPS location data to discover unusual patterns in enumerators work.

With this information:

- ✓assess performance of the interviewers;
- ✓estimate completion of survey;
- ✓plan field operations and teams;
- ✓creation of custom reports.

Secure and scalable

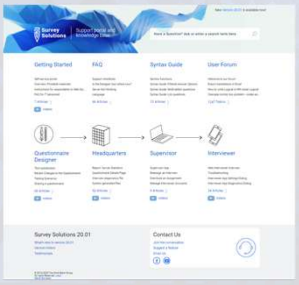
You can run your surveys on highly secure, scalable and free World Bank Cloud or deploy Survey Solutions on your own servers to fully control who and how could access your data.

✓No matter where the server is, Survey Solutions defends your data from unauthorized access and makes data and reports available only to authorized users. As a server administrator you can decide who is performing which role, and the scope of accessible information.

✓Instant data downloads and scheduled backups assure condence in safety and preservation of the collected data.

Supported

Survey Solutions is supported by a team of experts located in different time zones making advising faster and more responsive.



https://support.mysurvey.solutions/

More info

Everyone is welcomed to try Survey Solutions!

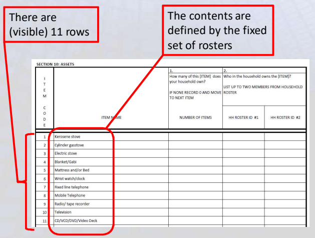
- The documentation for the software:
  http://support.mysurvey.solutions
- User forum:
  http://forum.mysurvey.solutions
- The web-based survey designer tool at:
  http://designer.mysurvey.solutions
- "Survey Solutions Tester" app at Google (TM) Play
- Check for yourself how you can capture and accumulate the data using our 24/7-available demo server:
  https://demo.mysurvey.solutions
- When ready, request and manage your dedicated Survey Solutions server:
  https://mysurvey.solutions

Rosters

Survey Solutions
Designer

Rosters

- Rosters are useful when you want to ask the same questions over and over again for many items/people.
- Rosters are not a question type, they are a special kind of groups.
- **Rosters are defined by two parameters**
  - Number of rows (i.e., size)
  - Items about which questions are asked (i.e., content)
- **Size comes from one of two sources**
  - Some external question or
  - Number of fixed items in the roster itself
- **Content is defined likewise**
  - Some external question
  - Fixed contents of the roster itself



There are (visible) 11 rows

The contents are defined by the fixed set of rosters

SECTION 10: ASSETS

ITEM CODE	ITEM NAME	1. How many of this [ITEM] does your household own? IF NONE RECORD 0 AND MOVE TO NEXT ITEM	2. Who in the household owns the [ITEM]? LIST UP TO TWO MEMBERS FROM HOUSEHOLD ROSTER	
		NUMBER OF ITEMS	HH ROSTER ID #1	HH ROSTER ID #2
1	Kerosene stove			
2	Cylinder gasstove			
3	Electric stove			
4	Blanket/Gabi			
5	Mattress and/or Bed			
6	Wrist watch/clock			
7	Fixed line telephone			
8	Mobile Telephone			
9	Radio/ tape recorder			
10	Television			
11	CD/VCD/DVD/Video Deck			

Rosters

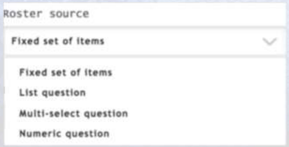
In Survey Solutions the rosters can grow or shrink to accommodate the changing number of items to be surveyed.

- This change is triggered by a special question, the trigger question, which can be one of several types:
  - Numeric question: when the number of items to be described is determined by a numeric question somewhere earlier in the questionnaire.
  - Text list question: when there is a list of items already collected earlier in the questionnaire, and additional information about these items is to be acquired.
  - Multiple choice question: when a list of choices is presented first, and then detailed information is acquired about each item that was selected.
- One may use a fixed roster, when the number of items is known at design time.

Rosters types

Survey Solutions has 4 roster sources.

- Three of them depend on the question type linked to the roster, which allow to rosters grow or shrink to accommodate the changing number of items to be surveyed :
  - ***numeric question*,** when the number of items to be described is determined by a numeric question somewhere earlier in the questionnaire;
  - ***list question*,** when there is a list of items already collected earlier in the questionnaire, and additional information about these items is to be acquired
  - ***multi-select question***, when a list of choices is presented first, and then detailed information is acquired about each item that was selected**.**
- No question is linked to the fourth roster source: ***fixed set of items***.

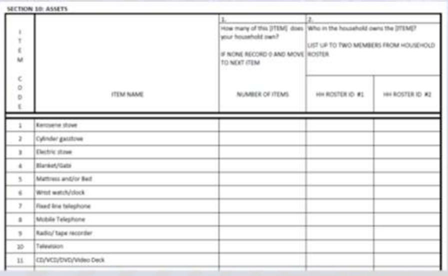


Roster source

Fixed set of items

Fixed roster

Paper version of the fixed roster



SECTION 10: ASSETS

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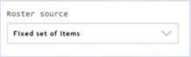
		NUMBER OF ITEMS	HH ROSTER ID #1	HH ROSTER ID #2
1	Kerosene stove			
2	Cylinder gasstove			
3	Electric stove			
4	Blanket/Gabi			
5	Mattress and/or Bed			
6	Wrist watch/clock			
7	Fixed line telephone			
8	Mobile Telephone			
9	Radio/ tape recorder			
10	Television			
11	CD/VCD/DVD/Video Deck			

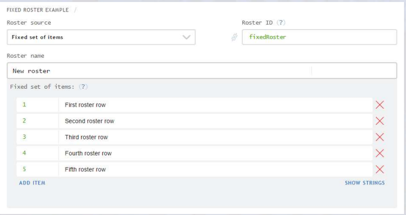
Fixed roster



Roster source

Fixed set of items

Fixed roster used when the number of items is known at design time.



FIXED ROSTER EXAMPLE /

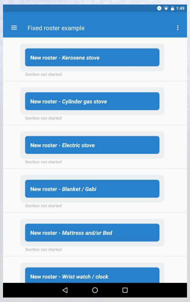
Roster source: Fixed set of items

Roster ID (?): fixedRoster

Roster name: New roster

Fixed set of items: (?)

1	First roster row
2	Second roster row
3	Third roster row
4	Fourth roster row
5	Fifth roster row



New roster - *Kerosene stove*

Section not started

New roster - *Cylinder gas stove*

Section not started

New roster - *Electric stove*

Section not started

New roster - *Blanket / Gabi*

Section not started

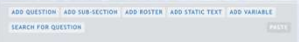
New roster - *Mattress and/or Bed*

Section not started

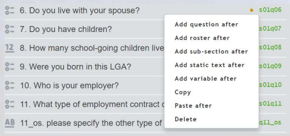
New roster - *Wrist watch / clock*

Create Roster: Step 1

Option 1: Click a button "ADD ROSTER"

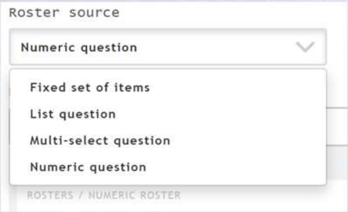


Option 2: Right click and choose "Add roster after" from the menu


6. Do you live with your spouse? s01q06
7. Do you have children? s01q07
8. How many school-going children live s01q08
9. Were you born in this LGA? s01q09
10. Who is your employer? s01q10
11. What type of employment contract c s01q11
11_os. please specify the other type of q11_os

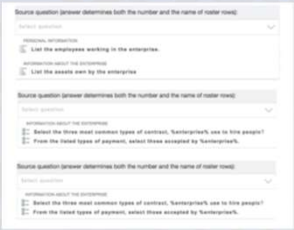
Create a roster: Step 2

Select the roster source from the drop-down menu


Roster source: Numeric question

Create a roster: Step 3

For list, multi-select and numeric specify source question


Source question (answer determines both the number and the name of roster rows):

Select question

PERSONAL INFORMATION
List the employees working in the enterprise.
INFORMATION ABOUT THE ENTERPRISE
List the assets own by the enterprise

Source question (answer determines both the number and the name of roster rows):

Select question

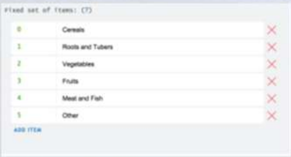
INFORMATION ABOUT THE ENTERPRISE
Select the three most common types of contract, %enterprise% use to hire people?
From the listed types of payment, select those accepted by %enterprise%.

Source question (answer determines both the number and the name of roster rows):

Select question

INFORMATION ABOUT THE ENTERPRISE
Select the three most common types of contract, %enterprise% use to hire people?
From the listed types of payment, select those accepted by %enterprise%.

For fixed roster: Specify fixed set of items

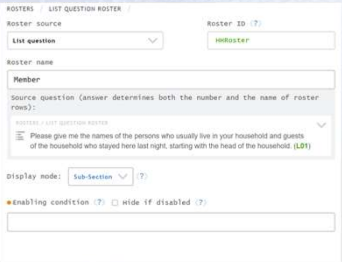

Fixed set of items: (?)

0	Cereals
1	Roots and Tubers
2	Vegetables
3	Fruits
4	Meat and Fish
5	Other

Create a roster: Step 4

Provide other parameters:

- **Roster variable name**: Use for roster validations
- **Roster name**: What interviewers see on the tablet
- **Display mode**: Presentations of a roster on a screen.
- **Enabling conditions:** Determines which rows will appear in the roster


ROSTERS / LIST QUESTION ROSTER /

Roster source: List question

Roster ID (?): HHRoster

Roster name: Member

Source question (answer determines both the number and the name of roster rows):

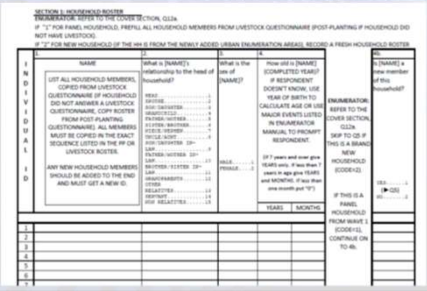
ROSTERS / LIST QUESTION ROSTER
Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household. (L01)

Display mode: Sub-Section (?)

Enabling condition (?) □ Hide if disabled (?)

List roster

Paper version of the list roster

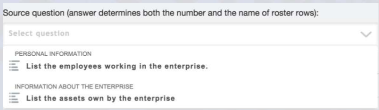

SECTION 1: HOUSEHOLD ROSTER
ENUMERATOR: REFER TO THE COVER SECTION, Q12a.
IF "1" FOR PANEL HOUSEHOLD, PREFILL ALL HOUSEHOLD MEMBERS FROM LIVESTOCK QUESTIONNAIRE (POST-PLANTING IF HOUSEHOLD DID NOT HAVE LIVESTOCK).
IF "2" FOR NEW HOUSEHOLD (IF THE HH IS FROM THE NEWLY ADDED URBAN ENUMERATION AREAS), RECORD A FRESH HOUSEHOLD ROSTER

I N D I V I D U A L I D	1. NAME LIST ALL HOUSEHOLD MEMBERS, COPIED FROM LIVESTOCK QUESTIONNAIRE (IF HOUSEHOLD DID NOT ANSWER A LIVESTOCK QUESTIONNAIRE, COPY ROSTER FROM POST-PLANTING QUESTIONNAIRE). ALL MEMBERS MUST BE COPIED IN THE EXACT SEQUENCE LISTED IN THE PP OR LIVESTOCK ROSTER. ANY NEW HOUSEHOLD MEMBERS SHOULD BE ADDED TO THE END AND MUST GET A NEW ID.	2. What is [NAME]'s relationship to the head of household? HEAD 1 SPOUSE 2 SON/DAUGHTER 3 GRANDCHILD 4 FATHER/MOTHER 5 SISTER/BROTHER 6 NIECE/NEPHEW 7 UNCLE/AUNT 8 SON/DAUGHTER IN-LAW 9 FATHER/MOTHER IN-LAW 10 BROTHER/SISTER IN-LAW 11 GRANDPARENTS 12 OTHER RELATIVES 13 SERVANT 14 NON RELATIVES 15	3. What is the sex of [NAME]? MALE 1 FEMALE 2	4. How old is [NAME] (COMPLETED YEARS)? IF RESPONDENT DOESN'T KNOW, USE YEAR OF BIRTH TO CALCULATE AGE OR USE MAJOR EVENTS LISTED IN ENUMERATOR MANUAL TO PROMPT RESPONDENT. (IF 7 years and over give YEARS only. If less than 7 years in age give YEARS and MONTHS. If less than one month put "0")		ENUMERATOR: REFER TO THE COVER SECTION, Q12a. SKIP TO Q5 IF THIS IS A BRAND NEW HOUSEHOLD (CODE=2). IF THIS IS A PANEL HOUSEHOLD FROM WAVE 1 (CODE=1), CONTINUE ON TO 4b.	4b. Is [NAME] a new member of this household? YES 1 (▶Q5) NO 2
				YEARS	MONTHS		
1							
2							
3							
4							
5							
6							
7							

List roster

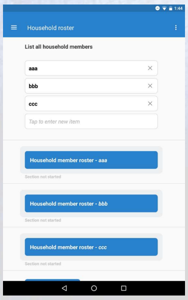
Roster source: List question

- ➢ List roster is triggered by a text list question.
- ➢ This question should precede the roster in the order of the questions in the questionnaire.


Source question (answer determines both the number and the name of roster rows):

Select question

PERSONAL INFORMATION
List the employees working in the enterprise.
INFORMATION ABOUT THE ENTERPRISE
List the assets own by the enterprise


1:44

Household roster

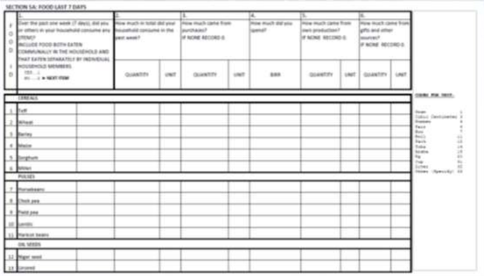
List all household members

aaa
bbb
ccc
Tap to enter new item

Household member roster - aaa
Section not started
Household member roster - bbb
Section not started
Household member roster - ccc
Section not started

Multi-select roster

Paper version of the multi-select roster

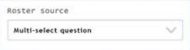


SECTION 5A: FOOD LAST 7 DAYS

F O O D I D	1. Over the past one week (7 days), did you or others in your household consume any [ITEM]? INCLUDE FOOD BOTH EATEN COMMUNALLY IN THE HOUSEHOLD AND THAT EATEN SEPARATELY BY INDIVIDUAL HOUSEHOLD MEMBERS. YES...1 NO...2 ► NEXT ITEM		2. How much in total did your household consume in the past week?		3. How much came from purchases? IF NONE RECORD 0		4. How much did you spend?	5. How much came from own production? IF NONE RECORD 0		6. How much came from gifts and other sources? IF NONE RECORD 0	
			QUANTITY	UNIT	QUANTITY	UNIT	BIRR	QUANTITY	UNIT	QUANTITY	UNIT
	CEREALS										
1	Teff										
2	Wheat										
3	Barley										
4	Maize										
5	Sorghum										
6	Millet										
	PULSES										
7	Horsebeans										
8	Chick pea										
9	Field pea										
10	Lentils										
11	Haricot beans										
	OIL SEEDS										
12	Niger seed										
13	Linseed										

CODES FOR UNIT: [illegible]

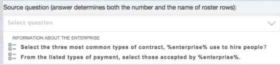
Multi-select roster



Roster source

Multi-select question

Triggered by a multi-select categorical question. This question should precede the roster in the order of the questions in the questionnaire.

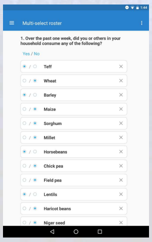


Source question (answer determines both the number and the name of roster rows):

Select question

INFORMATION ABOUT THE ENTERPRISE

- Select the three most common types of contract, %enterprise% use to hire people?
- From the listed types of payment, select those accepted by %enterprise%.

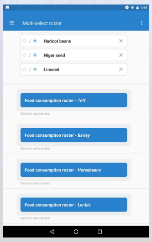


Multi-select roster

1. Over the past one week, did you or others in your household consume any of the following?

Yes / No

- ● / ○ Teff
- ○ / ● Wheat
- ● / ○ Barley
- ○ / ● Maize
- ○ / ● Sorghum
- ○ / ● Millet
- ● / ○ Horsebeans
- ○ / ● Chick pea
- ○ / ● Field pea
- ● / ○ Lentils
- ○ / ● Haricot beans
- ○ / ● Niger seed



Multi-select roster

- ○ / ● Haricot beans
- ○ / ● Niger seed
- ○ / ● Linseed

Food consumption roster - *Teff*

Section not started

Food consumption roster - *Barley*

Section not started

Food consumption roster - *Horsebeans*

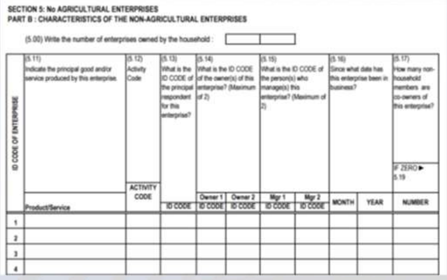
Section not started

Food consumption roster - *Lentils*

Section not started

Numeric roster

Paper version of the numeric roster

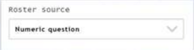


SECTION 5: No AGRICULTURAL ENTERPRISES
PART B : CHARACTERISTICS OF THE NON-AGRICULTURAL ENTERPRISES

(5.00) Write the number of enterprises owned by the household : □□

ID CODE OF ENTERPRISE	(5.11) Indicate the principal good and/or service produced by this enterprise.	(5.12) Activity Code	(5.13) What is the ID CODE of the principal respondent for this enterprise?	(5.14) What is the ID CODE of the owner(s) of this enterprise? (Maximum of 2)		(5.15) What is the ID CODE of the person(s) who manage(s) this enterprise? (Maximum of 2)		(5.16) Since what date has this enterprise been in business?		(5.17) How many non-household members are co-owners of this enterprise? IF ZERO ► 5.19
	Product/Service	ACTIVITY CODE	ID CODE	Owner 1 ID CODE	Owner 2 ID CODE	Mgr 1 ID CODE	Mgr 2 ID CODE	MONTH	YEAR	NUMBER
1										
2										
3										
4										

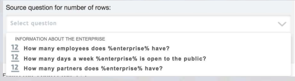
Numeric roster



Roster source

Numeric question

- Numeric roster is riggered by a numeric question.
- The numeric question should precede the roster in the order of the questions in the questionnaire.

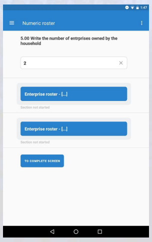


Source question for number of rows:

Select question

INFORMATION ABOUT THE ENTERPRISE

- 12 How many employees does %enterprise% have?
- 12 How many days a week %enterprise% is open to the public?
- 12 How many partners does %enterprise% have?



Numeric roster

5.00 Write the number of entrprises owned by the household

2

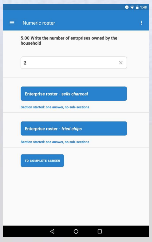
Enterprise roster - [...]

Section not started

Enterprise roster - [...]

Section not started

TO COMPLETE SCREEN



Numeric roster

5.00 Write the number of entrprises owned by the household

2

Enterprise roster - *sells charcoal*

Section started: one answer, no sub-sections

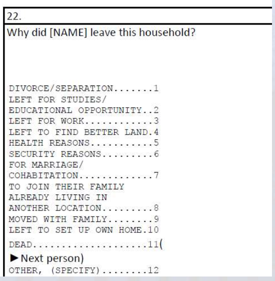
Enterprise roster - *fried chips*

Section started: one answer, no sub-sections

TO COMPLETE SCREEN

Piping

Problem on paper

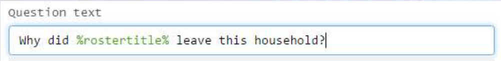


22.
Why did [NAME] leave this household?

```
DIVORCE/SEPARATION.......1
LEFT FOR STUDIES/
EDUCATIONAL OPPORTUNITY..2
LEFT FOR WORK............3
LEFT TO FIND BETTER LAND.4
HEALTH REASONS...........5
SECURITY REASONS.........6
FOR MARRIAGE/
COHABITATION.............7
TO JOIN THEIR FAMILY
ALREADY LIVING IN
ANOTHER LOCATION.........8
MOVED WITH FAMILY........9
LEFT TO SET UP OWN HOME.10
DEAD....................11(
► Next person)
OTHER, (SPECIFY)........12
```

Piping

Solutions in CAPI



Question text

`Why did %rostertitle% leave this household?`

In rosters

- %rostertitle% is replaced by the name of the current roster;
- rostertitle is a system-generated variable;
- Percentage signs surround where a value should be substituted

Elsewhere

- Can show the value of a variable with the same method;
- Suppose there is a variable arbitaryVariable;
- One can show its value by writing %arbitraryVariable%

Rosters

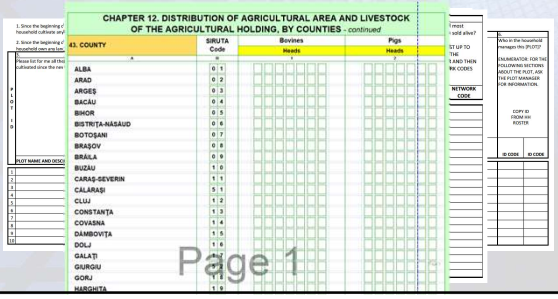
Live demo: rosters

Questions

1. What rosters are used for?
2. What roster should we use if we know a set of items from a questionnaire?
3. How many types of rosters are in Survey Solutions?
4. Which attribute sets a roster type?
5. Multi-select questions in what display mode can you select as a source question for a Multi-select roster?
6. %rostertitle% what interviewer will see on the screen instead of this substitution?

Exercise

What roster type would you use and why?



1. Since the beginning o household cultivate any

2. Since the beginning o household own any lan

3. Please list for me all the cultivated since the nev

PLOT ID

PLOT NAME AND DESC

1
2
3
4
5
6
7
8
9
10

CHAPTER 12. DISTRIBUTION OF AGRICULTURAL AREA AND LIVESTOCK OF THE AGRICULTURAL HOLDING, BY COUNTIES - *continued*

43. COUNTY	SIRUTA Code	Bovines	Pigs
		Heads	Heads
A	B	1	2
ALBA	0 1		
ARAD	0 2		
ARGEȘ	0 3		
BACĂU	0 4		
BIHOR	0 5		
BISTRIȚA-NĂSĂUD	0 6		
BOTOȘANI	0 7		
BRAȘOV	0 8		
BRĂILA	0 9		
BUZĂU	1 0		
CARAȘ-SEVERIN	1 1		
CĂLĂRAȘI	5 1		
CLUJ	1 2		
CONSTANȚA	1 3		
COVASNA	1 4		
DÂMBOVIȚA	1 5		
DOLJ	1 6		
GALAȚI	1 7		
GIURGIU	5 2		
GORJ	1 8		
HARGHITA	1 9		

Page 1

most sold alive?

ST UP TO THE R AND THEN RK CODES

NETWORK CODE

6. Who in the household manages this [PLOT]?

ENUMERATOR: FOR THE FOLLOWING SECTIONS ABOUT THE PLOT, ASK THE PLOT MANAGER FOR INFORMATION.

COPY ID FROM HH ROSTER

ID CODE | ID CODE

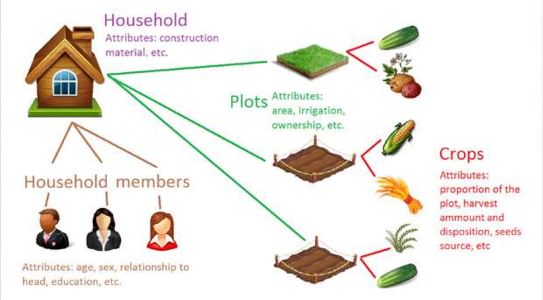
Exercise 6:

1. Create a New section called "Plot roster".
2. Download the file and create the questionnaire from the PDF questionnaire. Skip all conditions for now.
3. After you will finish, compile the questionnaire.
4. Test the section with Web-tester.

Nested rosters

- Rosters can be nested (included one into another).
- Typical use situations:
  - for every plot that the household owns, ask about which crops are grown on them;
  - for every household member ask about every job the person ever had before;
  - for every production item ask about components, and suppliers of these components, and characteristics of these suppliers;
- One can include rosters of different types one into another, for example, first level roster: list-triggered household members information, second level roster triggered by numeric question how many university degrees does this person have? collecting information on each degree (year, country, university name, field, etc);
- Maximum nesting depth for rosters is 4.

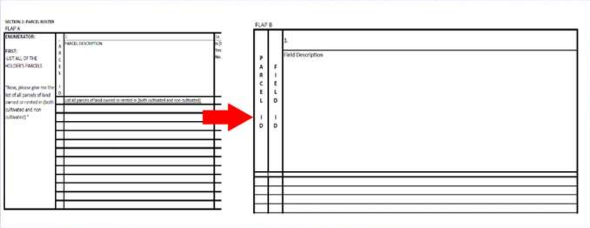
Nested rosters



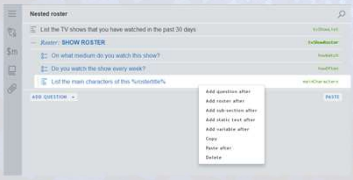
Household
Attributes: construction material, etc.
Plots
Attributes: area, irrigation, ownership, etc.
Crops
Attributes: proportion of the plot, harvest ammount and disposition, seeds source, etc
Household members
Attributes: age, sex, relationship to head, education, etc.

Nested rosters

Nested roster on a paper questionnaire


SECTION 2: PARCEL ROSTER
FLAP A
ENUMERATOR:
FIRST:
-LIST ALL OF THE HOLDER'S PARCELS
"Now, please give me the list of all parcels of land owned or rented in (both cultivated and non cultivated)."
PARCEL ID
PARCEL DESCRIPTION
List all parcels of land owned or rented in (both cultivated and non-cultivated)
FLAP B
PARCEL ID
FIELD ID
1.
Field Description

How to create a nested roster


Nested roster

List the TV shows that you have watched in the past 30 days

Roster: SHOW ROSTER

On what medium do you watch this show?

Do you watch the show every week?

List the main characters of this %rostertitle%

- ➢ Click within an existing roster
- ➢ Create a new roster

Nested rosters

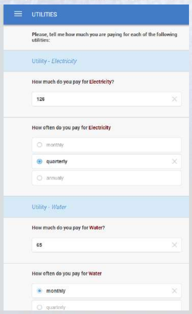
Live demo: Nested rosters

Flat mode roster

➢A flat mode roster is a presentation of the roster without buttons leading to a deeper level, but rather showing all the roster questions repeated in the same scrollable area.

➢This is especially convenient when there are only a handful of questions in the roster, such as price-quantity-unit for many items, and going behind the button and back is very time consuming for the interviewers.

➢In the example on the right a roster of expenditures on utilities containing questions on the amount and frequency for each utility consumed is presented in plain mode.


UTILITIES

Please, tell me how much you are paying for each of the following utilities:

Utility - *Electricity*

How much do you pay for Electricity?

126

How often do you pay for Electricity

○ monthly
● quarterly
○ annualy

Utility - *Water*

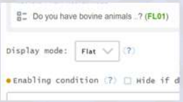
How much do you pay for Water?

65

How often do you pay for Water

● monthly
○ quarterly

Flat mode roster


Do you have bovine animals ..? (FL01)

Display mode: Flat

We designate the roster to be shown in flat mode simply by checking the corresponding checkbox ‘Flat’ in the Designer.

A roster may be presented in the plain view only if it doesn’t have any rosters nested into it, and contains a limited number of child elements (questions, static texts, subsections).

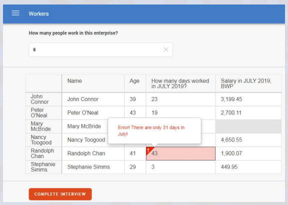
It is a good practice (though not mandatory) to place a flat roster in a sub-section, so that all of the roster items are isolated from any other fields in the questionnaire.

Flat mode

Live demo: flat mode

Table mode

Questionnaires of surveys administered in CAWI mode (web interviews) may include rosters that will be presented in table mode for compact overview of the information being collected, so that the questions become columns in the table and persons (or other roster items) form the rows of the table.



Workers

How many people work in this enterprise?

6

	Name	Age	How many days worked in JULY 2019?	Salary in JULY 2019, BWP
John Connor	John Connor	39	23	3,199.45
Peter O'Neal	Peter O'Neal	43	19	2,700.11
Mary McBride	Mary McBride			
Nancy Toogood	Nancy Toogood			4,650.55
Randolph Chan	Randolph Chan	41	43	1,900.07
Stephanie Simms	Stephanie Simms	29	3	449.95

Error! There are only 31 days in July!

NOTE:

- Rosters can be presented in tabular view only in CAWI mode and not on the tablet, must satisfy some design requirements and will have some functionality limitations.
- If the design requirements are not satisfied, a compilation error is issued by the Survey Solutions Designer.

Table mode

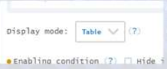
Design requirements:

- number of questions in the roster is no more than 10;
- may not contain questions of scope: supervisor;
- may not include questions of any type other than specifically: *text*, *numeric*;
- may not include: static texts, sub-sections, other rosters of any kind;
- may not include any text substitution in the questions' text.

Functionality limitations in tabular rosters:

- question instructions are not shown for questions;
- comments can't be left for questions by respondents/interviewers and are not shown in case they are left by the supervisors;
- when errors are shown, warnings are not shown;
- any roster items that are switched off by a condition on the roster are still shown in the table, though with all questions disabled;
- flag 'hide-if-disabled' is disregarded for questions and the roster itself.

Table mode



Display mode: Table

To indicate that the roster must be shown in tabular form the author of the questionnaire should set the '**Display mode**' parameter to '*Table*' in the properties of that roster.

If the designed questionnaire is administered as a web interview, the roster will appear in tabular presentation.

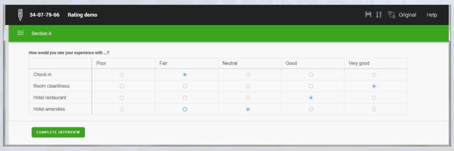
If it is administered on a tablet, it will fall back to the '*Sub-Section*' mode and presented as a set of sub-sections with questions about the roster items found behind the buttons.

Table mode

Live demo: table mode

Matrix mode

Single-select and multi-select categorical questions may now be presented in a more compact form suitable for ranking/matrix questions in CAWI mode.



34-07-79-66 Rating demo

Section A

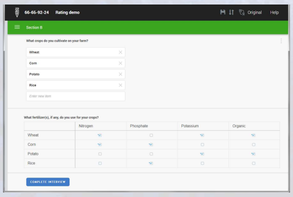
How would you rate your experience with ...?

	Poor	Fair	Neutral	Good	Very good
Check-in	○	●	○	○	○
Room cleanliness	○	○	○	○	●
Hotel restaurant	○	○	○	●	○
Hotel amenities	○	○	●	○	○

To create this structure the designer should place one (and only one) question into a roster. The categories of this question will determine the columns of the matrix (*'Poor'*…*'Very good'* in the above illustration), while the roster items will determine the rows. Finally the roster mode should be set to **Matrix**. We've added this mode to existing **Sub-Section**, **Flat**, and **Table** modes for the presentation of the roster.

Matrix mode

Number of rows may be fixed (use fixed roster) or be triggered by another question in the questionnaire, for example numeric, multi-select or a text-list. The question in the roster may also be a multi-select:



66-65-92-24 Rating demo

Section B

What crops do you cultivate on your farm?

Wheat

Corn

Potato

Rice

What fertilizer(s), if any, do you use for your crops?

	Nitrogen	Phosphate	Potassium	Organic
Wheat	☑	□	☑	☑
Corn	☑	☑	□	□
Potato	□	□	☑	☑
Rice	□	☑	□	□

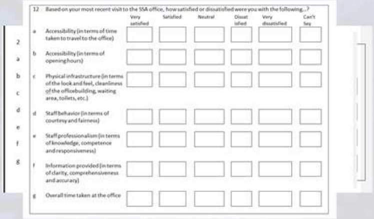
The matrix presentation of the roster is available only in the CAWI mode. In the CAPI mode such a roster will be presented as a roster with sub-sections.

Matrix mode

Live demo: matrix mode

Questions

1. What is the maximum nesting depth for a nested roster?
2. What question types could be in a roster in a display table mode?
3. What is the maximum number of questions inside a roster with display mode – matrix mode?
4. What question types could be inside a roster in matrix mode?
5. How would you implemented the question below?



12 Based on your most recent visit to the SSA office, how satisfied or dissatisfied were you with the following...?

		Very satisfied	Satisfied	Neutral	Dissatisfied	Very dissatisfied	Can't Say
a	Accessibility (in terms of time taken to travel to the office)	□	□	□	□	□	□
b	Accessibility (in terms of opening hours)	□	□	□	□	□	□
c	Physical infrastructure (in terms of the look and feel, cleanliness of the officebuilding, waiting area, toilets, etc.)	□	□	□	□	□	□
d	Staff behavior (in terms of courtesy and fairness)	□	□	□	□	□	□
e	Staff professionalism (in terms of knowledge, competence and responsiveness)	□	□	□	□	□	□
f	Information provided (in terms of clarity, comprehensiveness and accuracy)	□	□	□	□	□	□
g	Overall time taken at the office	□	□	□	□	□	□

Exercise 7:

Create a section with title: Romanian food.
Create within this section:

- Roster of household members
- For each household member, two questions
  - Do you like Romanian food?
  - What are your three favorite Romanian dishes?
- Flat Roster of Romanian dishes
- For each dish, two questions
  - When was the last time you ate it?
  - Was it good?

Macros and Variables

Macros

A macro with a name ***macroname*** contains a string of characters called the macro content.

You can refer to macros in any part of your questionnaire.

Macros is used to:

1. Improve readability of complex validation and enabling conditions
2. Simplify support and changes in the conditions that are repeated in several questions.

Macros

For example, that several questions in the questionnaire are applicable to one group of persons, such as children in age from 3 to 9 years old.

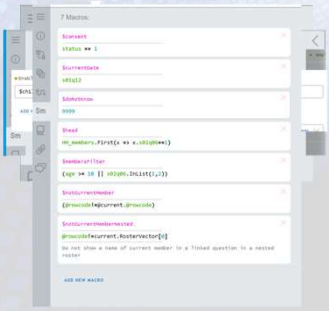
Then the following macro can be defined:
$child=age.InRange(3,9)

It can be subsequently used in the enabling conditions for each question directed to a child of certain age simply as $child, which will be substituted with the content of the macro as defined above.

Note that **macro definitions may not refer to other macros**.

To create a Macro:

1.Click on the “$m” tab on the left hand menu.
2.Click on the *ADD NEW Macros*link.
3.Define the macro name, content, and (optionally) a description for the macro.
4.Click save.
5. Add the macro to your condition, type “$” followed by the macro name in a condition field.
6. To modify a syntax in a Macro click on the macro icon, select a macro from the list by clicking on any field in the macro specification to make all the necessary revisions. And save the changes

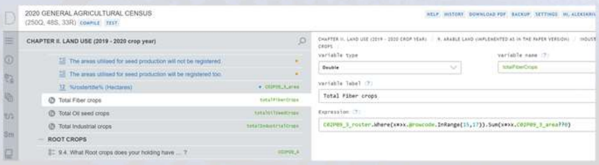


7 Macros

```
$consent
status == 1

$currentDate
s01q12

$doNotKnow
9999

$head
HH_members.First(x => x.s02q06==1)

$membersFilter
(age >= 18 || s02q06.InList(1,2))

$notCurrentMember
(@rowcode!=@current.@rowcode)

$notCurrentMemberNested
@rowcode!=current.RosterVector[0]
Do not show a name of current member in a linked question in a nested roster
```

Variables

Variables are computable expressions that can be used to simplify validation and enabling conditions that use complex expressions. The content of a variable can be substituted into question text or static text to provide text that is more informative and dynamic. Also, calculated variables are included in the export data files.



2020 GENERAL AGRICULTURAL CENSUS
(250Q, 48S, 33R)

CHAPTER II. LAND USE (2019 - 2020 crop year)

- The areas utilised for seed production will not be registered
- The areas utilised for seed production will be registered too
- %rostertitle% (Hectares)
- Total Fiber crops — totalFiberCrops
- Total Oil seed crops — totalOilseedCrops
- Total Industrial crops — totalIndustrialCrops
- ROOT CROPS
- 9.4. What Root crops does your holding have .... ?

Variable type: Double

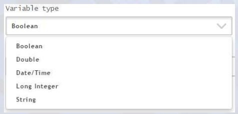
Variable name: totalFiberCrops

Variable label: Total Fiber crops

Expression:

```
C02P09_3_roster.Where(x=>x.@rowcode.InRange(15,17)).Sum(x=>x.C02P09_3_area??0)
```

Variables’ types

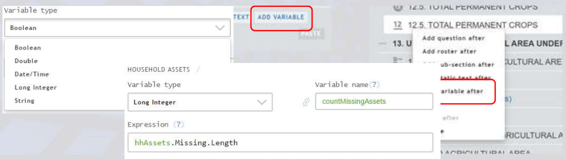


Variable type: Boolean

1. The boolean type can only evaluate to true or false.
2. The double type is a numeric type. Unlike the long integer type, the double type allows for numbers with decimal values (e.g. 2.5, 3.42).
3. The long Integer type should be used for integer values. Unlike the double type, this type will only allow for whole numbers (e.g. 2, 42, 7329).
4. The Date/Time type are for values that are date and/or time.
5. The string type for text values.

Add a Variable

1. Right click on a component in a section content to pull up the context menu and then “Add variable” / or / press the button “Add variable” at the bottom of a section content.
2. Choose the data type that you expect the variable’s expression to evaluate to (ie numeric, true/false, text).
3. Specify variable name.
4. Specify the expression.



HOUSEHOLD ASSETS /

Variable type: Long Integer

Variable name (?): countMissingAssets

Expression (?): hhAssets.Missing.Length

Macros and Variables (common)

- ➢simplify complex expressions by breaking them down to smaller parts;
- ➢simplify creation of large questionnaires with repetitive condition;
- ➢hint on the meaning of expression by their name (or description);
- ➢simplify changes to parameters and definitions in the survey;
- ➢may be used to hold survey parameters;

Macros and Variables (different)

Macros	Variables
are referred to by $name	are referred to by name
don’t have to be syntactically correct	have to be syntactically correct
fragments of expressions	expressions
don’t have a declared type	have a declared type (string, long?, double? DateTime?, Boolean?)
computed every time when encountered	computed once every evaluation cycle
have descriptions visible in Designer only	have descriptive labels visible in Designer and in debug mode on Tester
may not refer to other macros	may refer to other variables
may not be used in text piping	may be used in text piping
not exported	exported

Exercise 13:

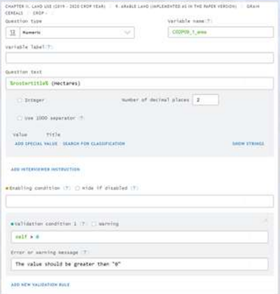
1. Download the questionnaire for the exercise.
2. Implement the questionnaire as a section “Land use”.
3. All totals should be calculated as variables and then checked with each total field.
4. Add extra logic for “of which” questions.

System generated Variables for conditions

@rowcode

Live demo: EVC generated variables

Self



CHAPTER II. LAND USE (2019 - 2020 CROP YEAR) > 9. ARABLE LAND (IMPLEMENTED AS IN THE PAPER VERSION) > GRAIN CEREALS > CROP -

Question type: Numeric

Variable name: C02P09_1_area

Variable label

Question text: %rostertitle% (Hectares)

○ Integer

Number of decimal places: 2

○ Use 1000 separator

Enabling condition (?) ○ Hide if disabled (?)

Validation condition 1 (?) □ Warning

```
self > 0
```

Error or warning message (?): The value should be greater than "0"

- ➢For validation conditions, a very useful system generate variable is self.
- ➢This variable denotes the value of the question being validated.
- ➢Using self instead of the question's variable name in a question's validation conditions is advised because you will not have to change the variable name in the validation condition if the variable name for the question is changed.
- ➢It is important to note that using self in the enabling condition will cause an compile error.

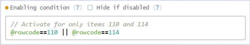
Exercise 11.

1. Download the questionnaire and create a section "Household Roster short".
2. Validation rules:
   - 2.1. The first person listed should be the Head of household;
   - 2.2. There should be only one head of household;
   - 2.3. Head of household should be at least 15 years old;
   - 2.4. Create a warning that its rare that household head and spouse have the same sex.

@rowcode

This system generated variable allows you to reference specific rows within a roster. This variable can be used in enabling conditions and validations.

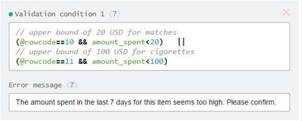
Example 1:
Assume you have roster of items and you have a question that should only be asked of two of the items (item #110 and item #114). In this case, you would use @rowcode to refer to the item number. Then you would use @rowcode and write the enabling condition to be like below:



● Enabling condition (?) □ Hide if disabled (?)

```
// Activate for only items 110 and 114
@rowcode==110 || @rowcode==114
```

Example 2:
Assume you have a roster of items that the household could have bought in the last 7 days. You want to check that the amount of money spent is not too high. Two of the items on the list are matches (item# 10) and cigarettes (item #11)



● Validation condition 1 (?)

```
// upper bound of 20 USD for matches
(@rowcode==10 && amount_spent<20)   ||
// upper bound of 100 USD for cigarettes
(@rowcode==11 && amount_spent<100)
```

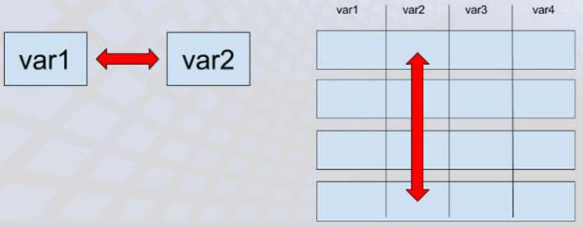
Error message (?): The amount spent in the last 7 days for this item seems too high. Please confirm.

Conditions in Rosters

Assesment of what we’ve done so far

Up until now we coded conditions horizontally by referring to the values of other variables for the current occurrence

…but roster conditions also require vertically by referring to the values of the same variable for other items in the roster

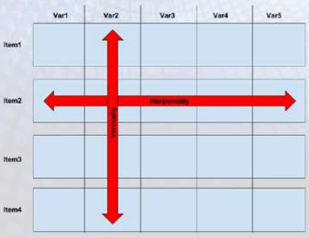


Two types of conditions

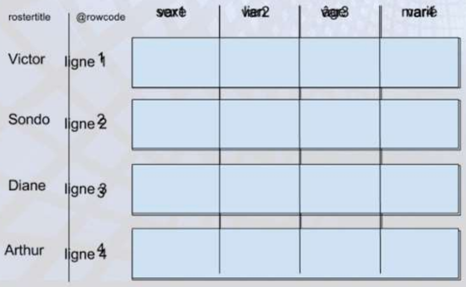
As we know rosters are common survey instruments (ie household roster, assets roster, food consumption roster).
Using Language Integrated Query (LINQ) and lambda expressions in the C# language, we are able to code enabling and validation conditions for rosters that can both:

✓Horizontally: Refer to the values of other variables for the current occurrence.

✓Vertically: Refer to the values of the same variable for other items in the roster.



Technical sketch of rosters



General Syntax

RosterID.Operator(x => x.varQuery1 == 1...)

Item	Explanation
RosterID	Name of the roster of interest to query. This is where to find the variables you are interested in.
Operator	Query operator. The action that you want to be performed
x	Anonymous variable that captures the queried content. This is just a place holder and can be anything (eg a, b, person)
x.varQuery	Query variable(s); instance of that (those) variable(s)

The part of the syntax in the parentheses after the operator is called the “lambda expression.” The lambda expression specifies the query criteria for the LINQ expression.
The value that is returned by the statement depends on the operator used.

Lambda expressions

Use lambda expressions to select items in rosters:

@rowcode	name	age	sex
1	John	40	1
2	Jessica	38	2
3	Joseph	18	1
4	Joel	18	1
5	Julia	18	2
6	Jeffrey	14	1
7	Jack	12	1
8	Juan	10	1
9	Justina	1	2
10	James	0	1

members.Where(person=>person.sex==2)

@rowcode	name	age	sex
1	John	40	1
2	Jessica	38	2
3	Joseph	18	1
4	Joel	18	1
5	Julia	18	2
6	Jeffrey	14	1
7	Jack	12	1
8	Juan	10	1
9	Justina	1	2
10	James	0	1

members.Select(person=>person.age)

Commonly Used Operators

.All()

- **Explanation.** Checks that all elements of the expression meet the query criteria
- **Result.** true / false

.Any()

- **Explanation.** Checks that at least one element of the expression meets the query criteria.
- **Result.** true / false

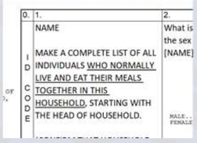
.Count()

- **Explanation.** Counts the number of elements that meet the query criteria.
- **Result.** The count

.FirstOrDefault()

- **Explanation.** Find the first element that meets the criteria
- **Result.** The first element. In most cases, this will be the first row that matches the search criteria If no element matches the query criteria, then it returns null

Example 1.



0.	1.	2.
I D C O D E	NAME MAKE A COMPLETE LIST OF ALL INDIVIDUALS WHO NORMALLY LIVE AND EAT THEIR MEALS TOGETHER IN THIS HOUSEHOLD, STARTING WITH THE HEAD OF HOUSEHOLD.	What is the sex [NAME] MALE.. FEMALE

We want to check that the household contains one and only one household head. This is a common validation in many household surveys.

For this approach, we would like to flag an error in the following cases:

1. There is more than one household head
2. There is no household head

Since Designer allows for more than one validation conditions for each question, we will write a separate validation condition for each case so that we can provide more detailed error messages to the interviewers.

Live demo: Conditions with a head of household

Example 2.

Assume we want to enable a section only if there are any woman 15-49 years old in the household.

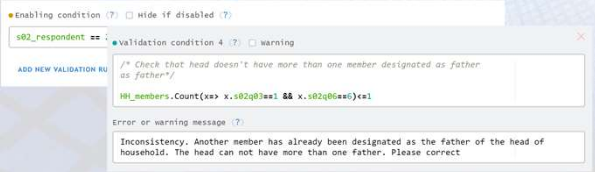
```
/* Enable only if there are any women 15-49 yo in the household */

hhroster.Any(x=>x.Gender==2 && x.Age>=15 && x.Age<=49)
```

In words, the expression above says:
in the hhroster roster, look to see if there is any household member who is a woman and is between the age of 15 and 49 years old.
Since we used the operator *Any*, this expression will return true if there are any woman 15-49 years old in the household. It will return false if there are none. If instead we wanted to count the number of women 15-49 years old in the household, then we would use the *Count* operator.

Live demo:

Enabling and validation conditions

Enabling conditions



● Enabling condition (?) □ Hide if disabled (?)

```
s02_respondent == 2
```

ADD NEW VALIDATION RU

● Validation condition 4 (?) □ Warning

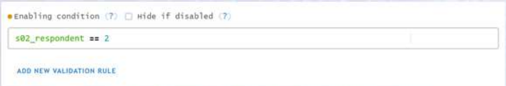
```
/* Check that head doesn't have more than one member designated as father
as father*/

HH_members.Count(x=> x.s02q03==1 && x.s02q06==6)<=1
```

Error or warning message (?)

Inconsistency. Another member has already been designated as the father of the head of household. The head can not have more than one father. Please correct

Enabling conditions allow you to enable or disable certain questions based on answers an interviewee has given in previous questions, while validation conditions evaluate whether an answer given by an interviewee is acceptable.

Enabling conditions



● Enabling condition (?) □ Hide if disabled (?)

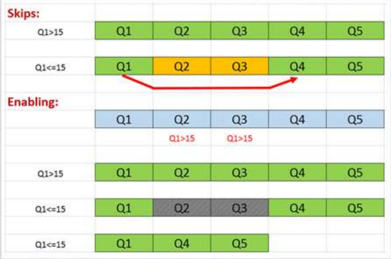
```
s02_respondent == 2
```

ADD NEW VALIDATION RULE

✓*Enabling conditions* are the Survey Solutions equivalents of skip patterns in paper-based questionnaires.
✓By using conditions you can enable or disable certain questions based on the answers an interviewee has given in previous questions. For this reason, at least two questions are involved, let's call them: the unleash question and the recipient question.
✓ Enabling conditions are used to determine when a question (or other component) should be enabled (asked);
✓A question is asked when it has no enabling condition or this condition currently evaluates to true;
✓If the condition evaluates to false the question is either inactive or hidden.

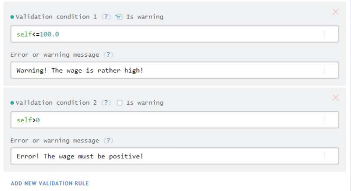
Enabling conditions

For example, suppose the questions on marital status (Q2) and employment status (Q3) should only be asked to adults (Q1 more than 15).



Skips:					
Q1>15	Q1	Q2	Q3	Q4	Q5
Q1<=15	Q1	Q2	Q3	Q4	Q5
Enabling:					
	Q1	Q2	Q3	Q4	Q5
		Q1>15	Q1>15		
Q1>15	Q1	Q2	Q3	Q4	Q5
Q1<=15	Q1	Q2	Q3	Q4	Q5
Q1<=15	Q1	Q4	Q5		

Validation conditions



● Validation condition 1 (?) ☑ Is warning

```
self<=100.0
```

Error or warning message (?)

Warning! The wage is rather high!

● Validation condition 2 (?) □ Is warning

```
self>0
```

Error or warning message (?)

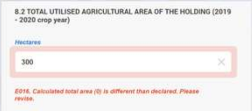
Error! The wage must be positive!

ADD NEW VALIDATION RULE

- *Validation conditions* are created similarly to enabling conditions.
- Instead of evaluating whether the question has to be displayed, it determines whether the answer given by the interviewee is acceptable.
- These can also be programmed as validation warnings. The warnings are rendered differently from errors (appear in orange color rather than red) and not counted in the interview errors counter. They are also not recorded in paradata.
- You can have up to 10 validation conditions for each question.

Validation conditions

Error



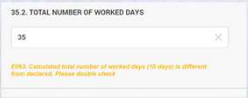
8.2 TOTAL UTILISED AGRICULTURAL AREA OF THE HOLDING (2019 - 2020 crop year)

Hectares

300

E016. Calculated total area (0) is different than declared. Please revise.

Warning

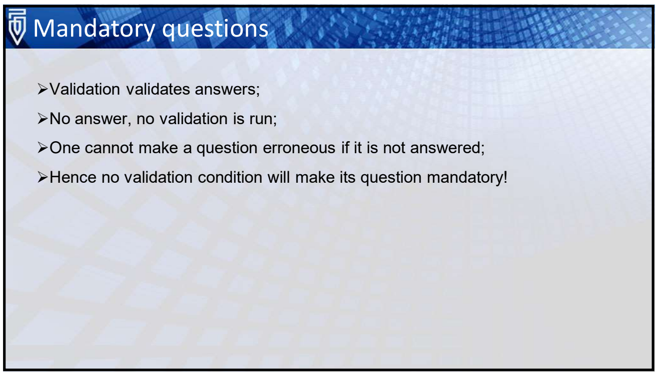


35.2. TOTAL NUMBER OF WORKED DAYS

35

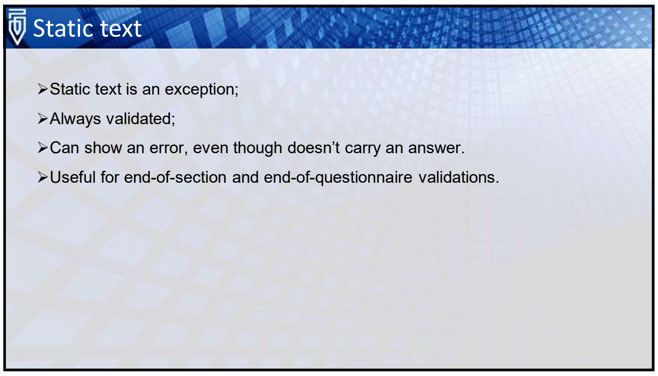
E063. Calculated total number of worked days (10 days) is different from declared. Please double check

➢The error message must be clear to the interviewer. Make sure all error messages programmed in the questionnaire are explained to the interviewers during their training.
➢When checking coherence of several questions (for example age and year of birth), one usually may not be sure which one is wrong. The message should allow for the possibility that the error is in the other question.
➢Make sure validation message is consistent with what is being checked. If you revise a validation condition, make sure to check if the corresponding message must also be revised.



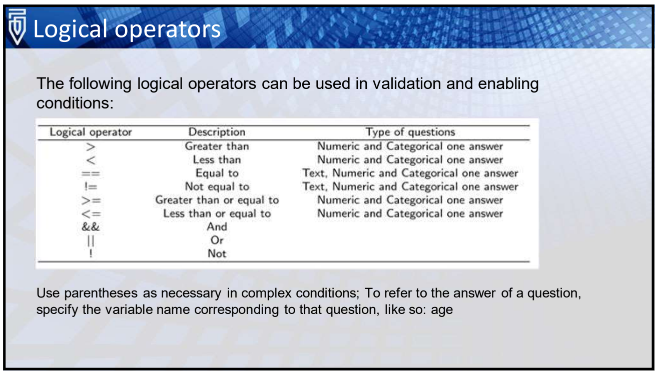
Mandatory questions

- ➢Validation validates answers;
- ➢No answer, no validation is run;
- ➢One cannot make a question erroneous if it is not answered;
- ➢Hence no validation condition will make its question mandatory!



Static text

- ➢Static text is an exception;
- ➢Always validated;
- ➢Can show an error, even though doesn't carry an answer.
- ➢Useful for end-of-section and end-of-questionnaire validations.

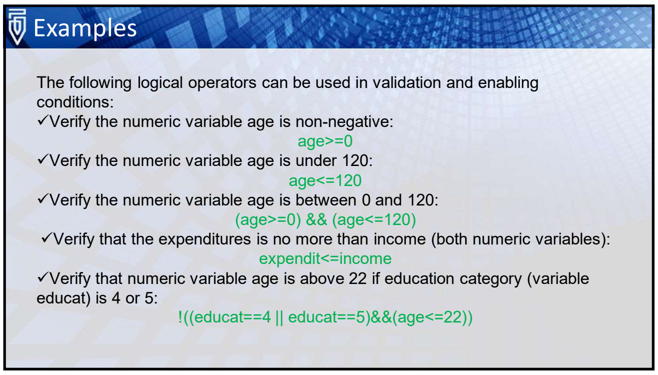


Logical operators

The following logical operators can be used in validation and enabling conditions:

Logical operator	Description	Type of questions
>	Greater than	Numeric and Categorical one answer
<	Less than	Numeric and Categorical one answer
==	Equal to	Text, Numeric and Categorical one answer
!=	Not equal to	Text, Numeric and Categorical one answer
>=	Greater than or equal to	Numeric and Categorical one answer
<=	Less than or equal to	Numeric and Categorical one answer
&&	And	
||	Or	
!	Not	

Use parentheses as necessary in complex conditions; To refer to the answer of a question, specify the variable name corresponding to that question, like so: age



Examples

The following logical operators can be used in validation and enabling conditions:

✓Verify the numeric variable age is non-negative:

age>=0

✓Verify the numeric variable age is under 120:

age<=120

✓Verify the numeric variable age is between 0 and 120:

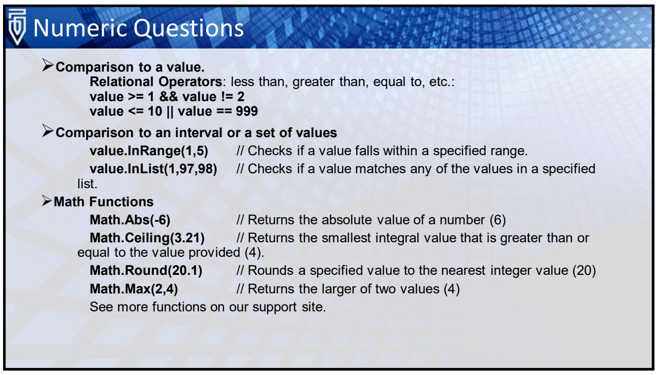
(age>=0) && (age<=120)

✓Verify that the expenditures is no more than income (both numeric variables):

expendit<=income

✓Verify that numeric variable age is above 22 if education category (variable educat) is 4 or 5:

!((educat==4 || educat==5)&&(age<=22))



Numeric Questions

➢**Comparison to a value.**

Relational Operators: less than, greater than, equal to, etc.:

value >= 1 && value != 2

value <= 10 || value == 999

➢**Comparison to an interval or a set of values**

value.InRange(1,5) // Checks if a value falls within a specified range.

value.InList(1,97,98) // Checks if a value matches any of the values in a specified list.

➢**Math Functions**

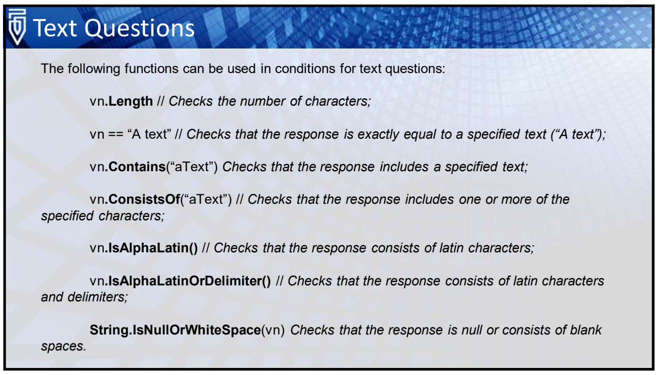
Math.Abs(-6) // Returns the absolute value of a number (6)

Math.Ceiling(3.21) // Returns the smallest integral value that is greater than or equal to the value provided (4).

Math.Round(20.1) // Rounds a specified value to the nearest integer value (20)

Math.Max(2,4) // Returns the larger of two values (4)

See more functions on our support site.



Text Questions

The following functions can be used in conditions for text questions:

vn**.Length** // *Checks the number of characters;*

vn == “A text” // *Checks that the response is exactly equal to a specified text (“A text”);*

vn**.Contains**(“aText”) *Checks that the response includes a specified text;*

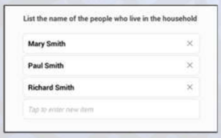
vn**.ConsistsOf**(“aText”) // *Checks that the response includes one or more of the specified characters;*

vn**.IsAlphaLatin()** // *Checks that the response consists of latin characters;*

vn**.IsAlphaLatinOrDelimiter()** // *Checks that the response consists of latin characters and delimiters;*

String.IsNullOrWhiteSpace(vn) *Checks that the response is null or consists of blank spaces.*

List question



List the name of the people who live in the household

Mary Smith

Paul Smith

Richard Smith

```
List of household members =
[
        {1, “Mary Smith”}
        {2, “Paul Smith”}
        {3, “Richard Smith”}
]
```

- The following functions can be used in conditions for list questions:

  vn.**Length** // *Checks the number of items listed*

  .Text // *Refers to the text element of an item listed in a list question*

Example: Suppose you want to make sure that in a list question (hhold_list) recording the list of household members the text element meaning the name being recorded is at least 5 characters long.

For this check, the validation condition would be:

hhold_list.All(x=>x.Text.Length>=5)

Barcode

The following functions can be used in conditions for barcode questions:

vn.**Length** // *Checks the number of characters*

vn.**StartsWith**(“value”) // *Checks that the barcode starts with specific characters*

vn.**EndsWith**(“value”) // *Checks that the barcode ends with specific characters*

vn.**IsNumber()** // *Checks that the barcode is a number*

vn.**ConsistsOf**(“value”) // *Checks that the barcode consists of a specific set characters*

Date question: Calendar

Comparisons

Relational Operators. // *Less than, greater than, equal to, etc*
vn.**InRange**(a,b) // *Checks if the date falls within an interval.*

**Perform Calculations

FullYearsBetween(dateA, dateB) // *Computes full years between an earlier and later date.*
dateB.**FullYearsSince**(dateA) // *Computes full years between a later date with an earlier date..*
vn.**Value.AddYears**(value)
vn.**Value.Months**(value)
vn.**Value.Days**(value) //*Add or subtract years, months, or days.*

Extract Information

vn.**Value.Year**
vn.**Value.Monthvn**
vn.**Value.Day** // *Retrieve the year, month, or day.*
new DateTime (year, month, day) // *Constructs a new date.*
IsDate(YearDate, MonthDate, DayDate) // *Confirms that a date matches a calendar date.*

Date question: Current Time

Extract Information

vn.**Value.Date** // *Retrieve the date.*
vn.**Value.Hour** // *Retrieve the hour.*

Perform Calculations

vn.**Value.AddHours**(value) // *Compute a date by adding a number of hours.*
vn.**Value.AddMinutes**(value) // *Compute a date by adding a number of minutes.*

GPS

Responses for the GPS questions are recorded as:

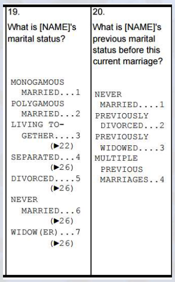
```
class {
  double Latitude;
  double Longitude;
  double Accuracy;
  double Altitude;
}
```

The following functions can be used in conditions for GPS questions:

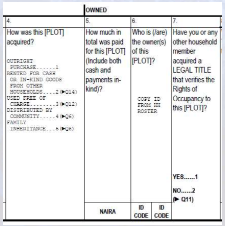
vn.**Longitude**,
vn.**Latitude**,
vn.**Accuracy**,
vn.**Altitude** // *Retrieves the latitude/longitude/accuracy/altitude of a GPS coordinate.*

vn.**InRectangle**(north,west,south,east) // Check if the coordinates are inside a rectangle.
gpsA.**GpsDistance**(gpsB) // *Calculate the distance between two coordinates in meters.*
gpsA.**GpsDistanceKm**(gpsB) // *Calculate the distance between two coordinates in kilometers.*

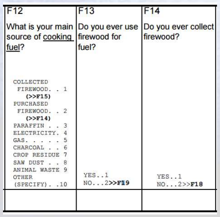
Single-select Questions



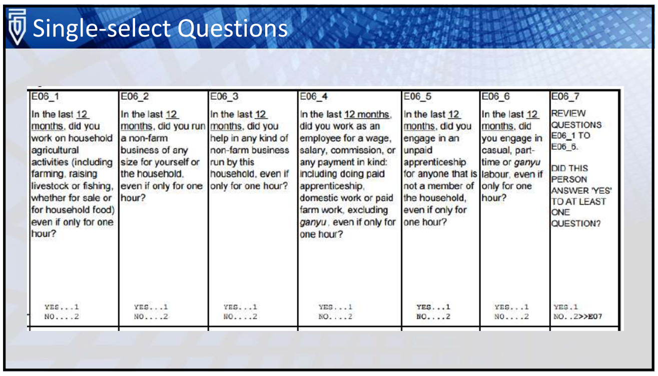
19.	20.
What is [NAME]'s marital status?	What is [NAME]'s previous marital status before this current marriage?
MONOGAMOUS MARRIED...1 POLYGAMOUS MARRIED...2 LIVING TO-GETHER....3 (►22) SEPARATED...4 (►26) DIVORCED....5 (►26) NEVER MARRIED...6 (►26) WIDOW(ER)...7 (►26)	NEVER MARRIED....1 PREVIOUSLY DIVORCED...2 PREVIOUSLY WIDOWED....3 MULTIPLE PREVIOUS MARRIAGES..4



	OWNED			
4.	5.	6.		7.
How was this [PLOT] acquired? OUTRIGHT PURCHASE......1 RENTED FOR CASH OR IN-KIND GOODS FROM OTHER HOUSEHOLDS....2 (►Q14) USED FREE OF CHARGE........3 (►Q12) DISTRIBUTED BY COMMUNITY.....4 (►Q6) FAMILY INHERITANCE...5 (►Q6)	How much in total was paid for this [PLOT] (Include both cash and payments in-kind)?	Who is (/are) the owner(s) of this [PLOT]? COPY ID FROM HH ROSTER		Have you or any other household member acquired a LEGAL TITLE that verifies the Rights of Occupancy to this [PLOT]? YES......1 NO......2 (► Q11)
	NAIRA	ID CODE	ID CODE	

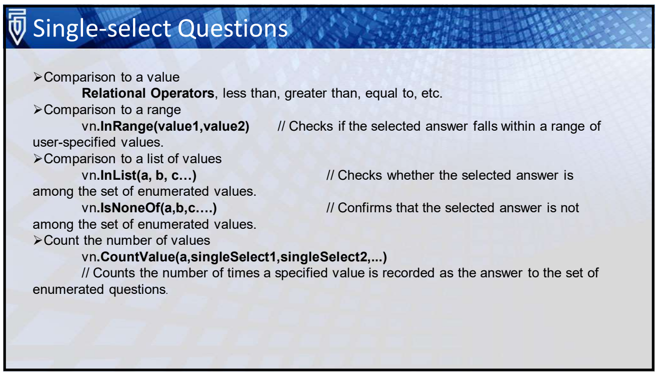


F12	F13	F14
What is your main source of cooking fuel? COLLECTED FIREWOOD. . 1 (>>F15) PURCHASED FIREWOOD. . 2 (>>F14) PARAFFIN . . 3 ELECTRICITY. 4 GAS. . . . . 5 CHARCOAL . . 6 CROP RESIDUE 7 SAW DUST . . 8 ANIMAL WASTE 9 OTHER (SPECIFY). .10	Do you ever use firewood for fuel? YES..1 NO...2>>F19	Do you ever collect firewood? YES..1 NO...2>>F18



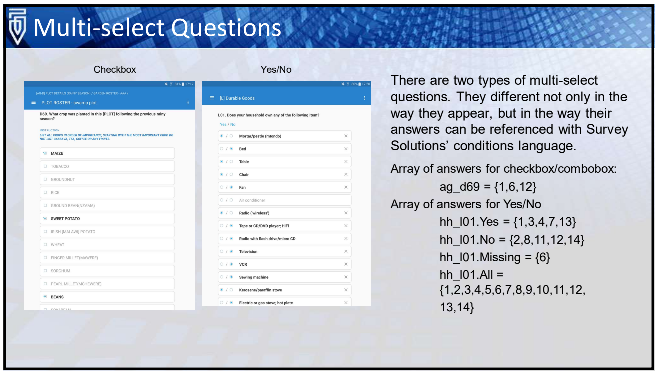
Single-select Questions

E06_1	E06_2	E06_3	E06_4	E06_5	E06_6	E06_7
In the last 12 months, did you work on household agricultural activities (including farming, raising livestock or fishing, whether for sale or for household food) even if only for one hour?	In the last 12 months, did you run a non-farm business of any size for yourself or the household, even if only for one hour?	In the last 12 months, did you help in any kind of non-farm business run by this household, even if only for one hour?	In the last 12 months, did you work as an employee for a wage, salary, commission, or any payment in kind: including doing paid apprenticeship, domestic work or paid farm work, excluding *ganyu* , even if only for one hour?	In the last 12 months, did you engage in an unpaid apprenticeship for anyone that is not a member of the household, even if only for one hour?	In the last 12 months, did you engage in casual, part-time or *ganyu* labour, even if only for one hour?	REVIEW QUESTIONS E06_1 TO E06_6. DID THIS PERSON ANSWER 'YES' TO AT LEAST ONE QUESTION?
YES...1 NO....2	YES...1 NO....2	YES...1 NO....2	YES...1 NO....2	YES...1 NO....2	YES...1 NO....2	YES.1 NO..2>>E07



Single-select Questions

➢Comparison to a value
Relational Operators, less than, greater than, equal to, etc.
➢Comparison to a range
vn.**InRange(value1,value2)** // Checks if the selected answer falls within a range of user-specified values.
➢Comparison to a list of values
vn.**InList(a, b, c…)** // Checks whether the selected answer is among the set of enumerated values.
vn.**IsNoneOf(a,b,c….)** // Confirms that the selected answer is not among the set of enumerated values.
➢Count the number of values
vn.**CountValue(a,singleSelect1,singleSelect2,...)**
// Counts the number of times a specified value is recorded as the answer to the set of enumerated questions.



Multi-select Questions

Checkbox

[AG-D] PLOT DETAILS (RAINY SEASON) / GARDEN ROSTER - AAA /
PLOT ROSTER - swamp plot
D69. What crop was planted in this [PLOT] following the previous rainy season?
INSTRUCTION
LIST ALL CROPS IN ORDER OF IMPORTANCE, STARTING WITH THE MOST IMPORTANT CROP. DO NOT LIST CASSAVA, TEA, COFFEE OR ANY FRUITS.
☑ MAIZE
□ TOBACCO
□ GROUNDNUT
□ RICE
□ GROUND BEAN(NZAMA)
☑ SWEET POTATO
□ IRISH [MALAWI] POTATO
□ WHEAT
□ FINGER MILLET(MAWERE)
□ SORGHUM
□ PEARL MILLET(MCHEWERE)
☑ BEANS

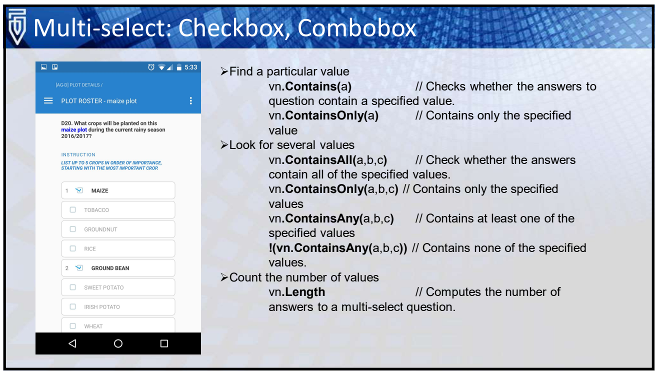
Yes/No

[L] Durable Goods
L01. Does your household own any of the following item?
Yes / No
● / ○ Mortar/pestle (mtondo)
○ / ● Bed
● / ○ Table
● / ○ Chair
○ / ● Fan
○ / ○ Air conditioner
● / ○ Radio ('wireless')
○ / ● Tape or CD/DVD player; HiFi
○ / ● Radio with flash drive/micro CD
○ / ● Television
○ / ● VCR
○ / ● Sewing machine
● / ○ Kerosene/paraffin stove
○ / ● Electric or gas stove; hot plate

There are two types of multi-select questions. They different not only in the way they appear, but in the way their answers can be referenced with Survey Solutions' conditions language.

Array of answers for checkbox/combobox:
ag_d69 = {1,6,12}

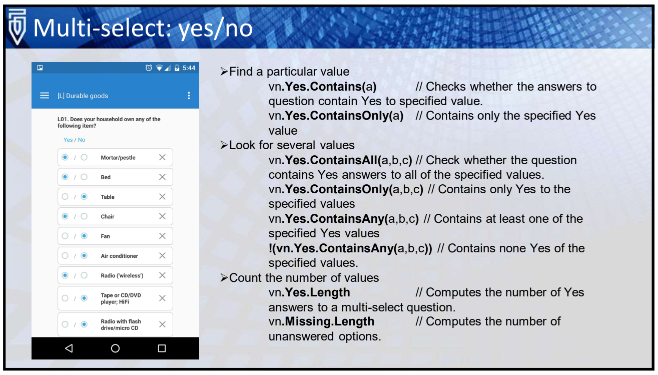
Array of answers for Yes/No
hh_l01.Yes = {1,3,4,7,13}
hh_l01.No = {2,8,11,12,14}
hh_l01.Missing = {6}
hh_l01.All = {1,2,3,4,5,6,7,8,9,10,11,12,13,14}



Multi-select: Checkbox, Combobox

[AG-D] PLOT DETAILS /
PLOT ROSTER - maize plot
D20. What crops will be planted on this maize plot during the current rainy season 2016/2017?
INSTRUCTION
LIST UP TO 5 CROPS IN ORDER OF IMPORTANCE, STARTING WITH THE MOST IMPORTANT CROP.
1 ☑ MAIZE
□ TOBACCO
□ GROUNDNUT
□ RICE
2 ☑ GROUND BEAN
□ SWEET POTATO
□ IRISH POTATO
□ WHEAT

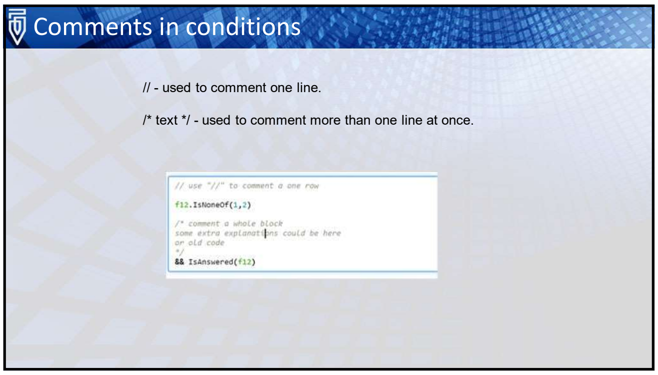
➢Find a particular value
vn.**Contains(a)** // Checks whether the answers to question contain a specified value.
vn.**ContainsOnly(a)** // Contains only the specified value
➢Look for several values
vn.**ContainsAll**(a,b,c) // Check whether the answers contain all of the specified values.
vn.**ContainsOnly**(a,b,c) // Contains only the specified values
vn.**ContainsAny**(a,b,c) // Contains at least one of the specified values
!(vn.ContainsAny(a,b,c**))** // Contains none of the specified values.
➢Count the number of values
vn.**Length** // Computes the number of answers to a multi-select question.



Multi-select: yes/no

[L] Durable goods
L01. Does your household own any of the following item?
Yes / No
● / ○ Mortar/pestle
● / ○ Bed
○ / ● Table
● / ○ Chair
○ / ● Fan
○ / ● Air conditioner
● / ○ Radio ('wireless')
○ / ● Tape or CD/DVD player; HiFi
○ / ● Radio with flash drive/micro CD

➢Find a particular value
vn.**Yes.Contains(a)** // Checks whether the answers to question contain Yes to specified value.
vn.**Yes.ContainsOnly**(a) // Contains only the specified Yes value
➢Look for several values
vn.**Yes.ContainsAll**(a,b,c) // Check whether the question contains Yes answers to all of the specified values.
vn.**Yes.ContainsOnly(**a,b,c**)** // Contains only Yes to the specified values
vn.**Yes.ContainsAny**(a,b,c) // Contains at least one of the specified Yes values
!(vn.Yes.ContainsAny(a,b,c**))** // Contains none Yes of the specified values.
➢Count the number of values
vn.**Yes.Length** // Computes the number of Yes answers to a multi-select question.
vn.**Missing.Length** // Computes the number of unanswered options.

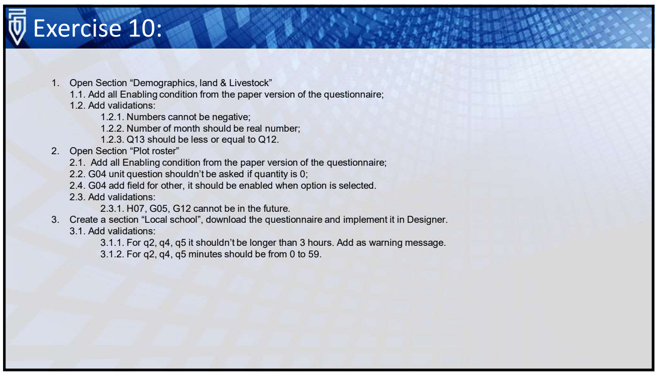


Comments in conditions

// - used to comment one line.

/* text */ - used to comment more than one line at once.

```
// use "//" to comment a one row

f12.IsNoneOf(1,2)

/* comment a whole block
some extra explanations could be here
or old code
*/
&& IsAnswered(f12)
```



Exercise 10:

1. Open Section “Demographics, land & Livestock”
   1.1. Add all Enabling condition from the paper version of the questionnaire;
   1.2. Add validations:
   1.2.1. Numbers cannot be negative;
   1.2.2. Number of month should be real number;
   1.2.3. Q13 should be less or equal to Q12.
2. Open Section “Plot roster”
   2.1. Add all Enabling condition from the paper version of the questionnaire;
   2.2. G04 unit question shouldn’t be asked if quantity is 0;
   2.4. G04 add field for other, it should be enabled when option is selected.
   2.3. Add validations:
   2.3.1. H07, G05, G12 cannot be in the future.
3. Create a section “Local school”, download the questionnaire and implement it in Designer.
   3.1. Add validations:
   3.1.1. For q2, q4, q5 it shouldn’t be longer than 3 hours. Add as warning message.
   3.1.2. For q2, q4, q5 minutes should be from 0 to 59.

Syntax and Functions

Expressions

Each expression has a type as per C# reference or Survey Solutions definition. C# language has hundreds of types and allows other composite types to be derived from base types.

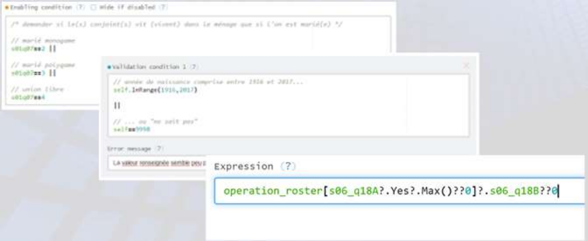
In Survey Solutions expressions for **enabling conditions**, validation conditions, and filtering conditions are of Boolean type: Boolean type means only two values are possible: **true** and **false**;

- ➢A question is enabled if the enabling condition is blank or evaluates to true;
- ➢Answer to a question is considered to be valid if the validation condition is blank or evaluates to true;
- ➢An option is included in a categorical question if a filter is blank or evaluates to true.

Expressions

Expressions are utilized in Survey Solutions in:

- ✓enabling conditions;
- ✓validation conditions;
- ✓filtering conditions;
- ✓calculated variables' expressions;



● Enabling condition (?) ☐ Hide if disabled (?)

```
/* demander si le(s) conjoint(s) vit (vivent) dans le ménage que si l'on est marié(e) */

// marié monogame
s01q07==2 ||

// marié polygame
s01q07==3 ||

// union libre
s01q07==4
```

● Validation condition 1 (?)

```
// année de naissance comprise entre 1916 et 2017...
self.InRange(1916,2017)

||

// ... ou "ne sait pas"
self==9998
```

Error message (?)

LA valeur renseignée semble peu

Expression (?)

```
operation_roster[s06_q18A?.Yes?.Max()??0]?.s06_q18B??0
```

Data types

Common types used to define calculatable variables are

- ➢**bool?** – Boolean nullable – for logical expressions;
- ➢**long?** – Long nullable – for storing integer values;
- ➢**double?** – Double nullable – for storing fractional values;
- ➢**string** – for storing strings (text);
- ➢**DateTime?** – Date/Time nullable – for storing timestamps with properties: Year, Month, Day, Hour, Minute, Second, and others;

In C# a question mark following the type signifies the type which is nullable, meaning null is a possible value;

Typical use of nullable value type is when needed to represent the undefined value of an underlying value type. For example, a Boolean, or **bool**, variable can only be either true or false. However, in some cases a variable value can be undefined or missing. For example, a database field may contain true or false, or it may contain no value at all, that is, **NULL**. The **bool?** type is used in those scenarios.

Expressions

Writing expressions is different from programming. You don't have to be a programmer to work with Survey Solutions, but there are several simple things every designer needs to know:

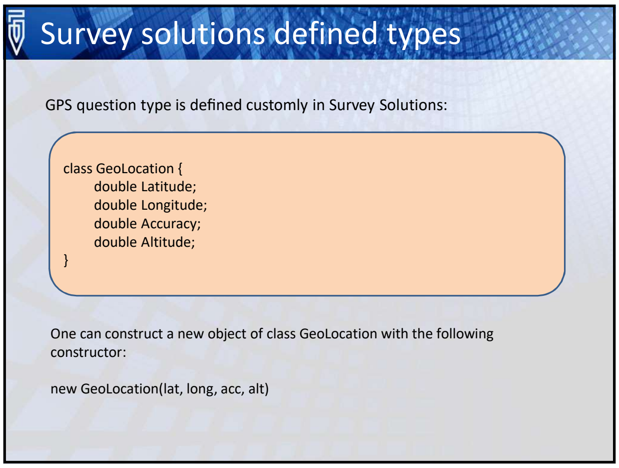
- ➢expressions are written in C#;
- ➢C# is a case-sensitive language;
- ➢To refer to the answer of a question, specify the variable name corresponding to that question, like so: age
- ➢To compare strings, enclose string constants in quotes, like so: city=="New York";
- ➢expressions should be free of syntax errors;
- ➢expressions have types.

Nullable types

Nullable - Each instance of a nullable type has two public read-only properties:

- ➢**HasValue**. HasValue indicates whether an instance of a nullable value type has a value of its underlying type. It is set to *true* when the variable contains a non-null value;
- ➢***Value***. Value is of the same type as the underlying type. If HasValue is true, Value contains a meaningful value.

In Survey Solutions value of **null** is used to indicate a question has not been answered yet.



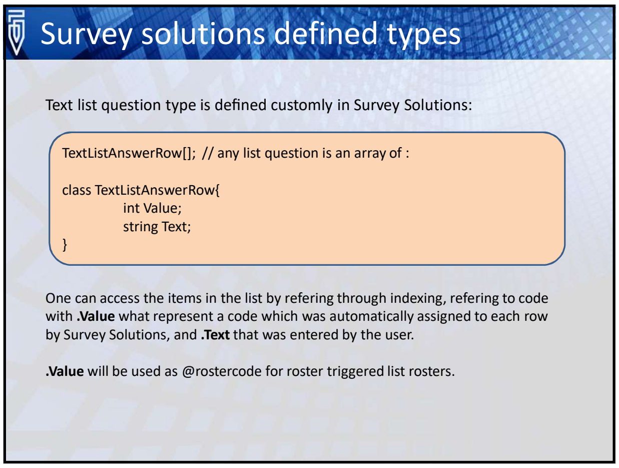
Survey solutions defined types

GPS question type is defined customly in Survey Solutions:

```
class GeoLocation {
        double Latitude;
        double Longitude;
        double Accuracy;
        double Altitude;
}
```

One can construct a new object of class GeoLocation with the following constructor:

new GeoLocation(lat, long, acc, alt)



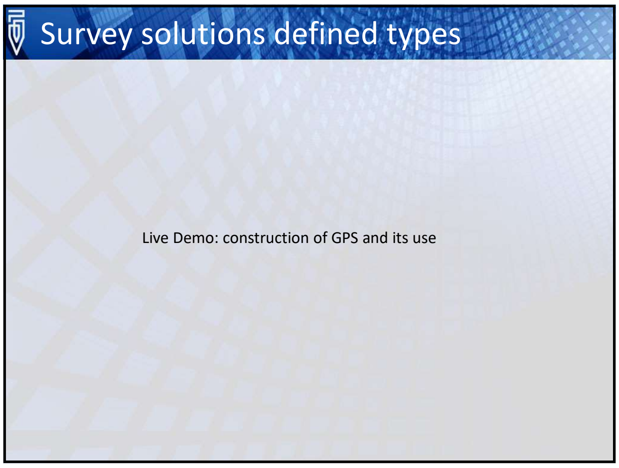
Survey solutions defined types

Text list question type is defined customly in Survey Solutions:

```
TextListAnswerRow[];  // any list question is an array of :

class TextListAnswerRow{
            int Value;
            string Text;
}
```

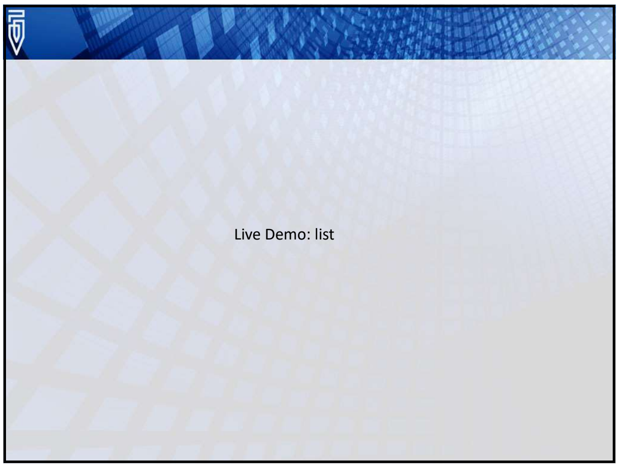
One can access the items in the list by refering through indexing, refering to code with **.Value** what represent a code which was automatically assigned to each row by Survey Solutions, and **.Text** that was entered by the user.

.Value will be used as @rostercode for roster triggered list rosters.

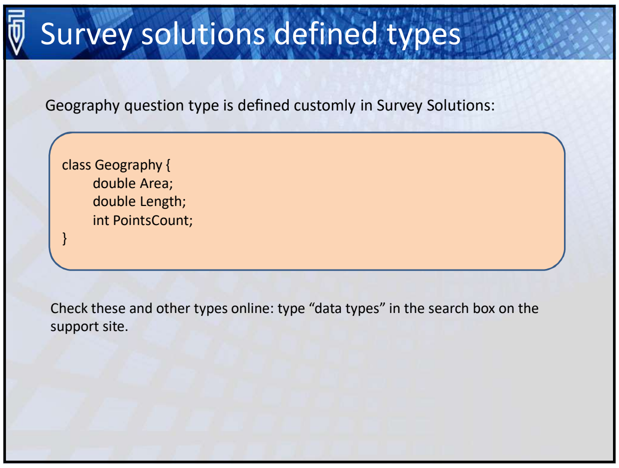


Survey solutions defined types

Live Demo: construction of GPS and its use



Live Demo: list

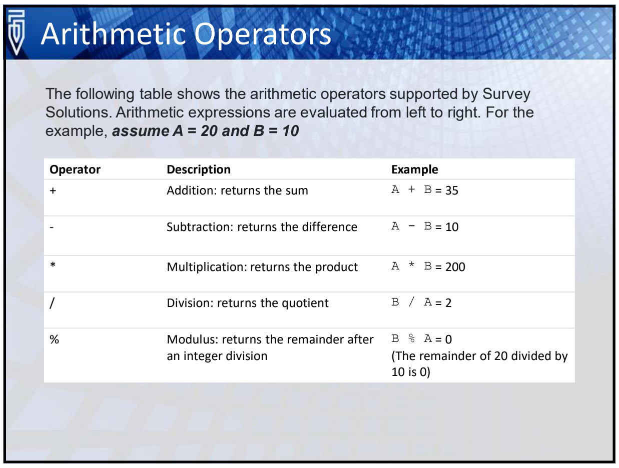


Survey solutions defined types

Geography question type is defined customly in Survey Solutions:

```
class Geography {
        double Area;
        double Length;
        int PointsCount;
}
```

Check these and other types online: type “data types” in the search box on the support site.



Arithmetic Operators

The following table shows the arithmetic operators supported by Survey Solutions. Arithmetic expressions are evaluated from left to right. For the example, ***assume A = 20 and B = 10***

Operator	Description	Example
+	Addition: returns the sum	`A + B` = 35
-	Subtraction: returns the difference	`A - B` = 10
*	Multiplication: returns the product	`A * B` = 200
/	Division: returns the quotient	`B / A` = 2
%	Modulus: returns the remainder after an integer division	`B % A` = 0 (The remainder of 20 divided by 10 is 0)

Relational Operators

These operators compare two values and return either **TRUE** or **FALSE.** The following comparison operators are supported by Survey Solutions:

Operator	Description	Example
==	Checks if the two values are *equal*. If values are equal, then the condition is true	`20 == 10` returns **FALSE**
!=	Checks if the two values are *not equal*. If the values are not equal, then the condition is false	`20 != 10` returns **TRUE**
>	Checks if the left value is *greater than* the right value	`20 > 10` returns **TRUE**
<	Checks if the left value is *less than* the right value	`20 < 10` returns **FALSE**
>=	Checks if the left value is *greater than or equal to* the right value	`20 >= 10` returns **TRUE.** `10 >= 10` returns **TRUE.**
<=	Checks if the left value is *less than or equal to* the right value	`20 <= 10` returns **FALSE.** `10 <= 10` returns **TRUE.**

Relational Operators

Warning!

❖Multi-categorical questions' value is a vector(an array), not a scalar (single value);
❖never use relational operators with MCQs;
❖instead use a function like: .Contains().

Logical operators

Logical values returns either **TRUE** or **FALSE**. The following tables show the logical operators supported by Survey Solutions:

Operator	Description	Example
&&	Logical AND operator. A && B returns true of *both* expression A and B are true.	`(20 == 10) && (10 > 5)` returns **FALSE** `(10 == 10) && (10 > 5)` returns **TRUE**
||	Logical OR operator A || B returns true if *either* expression A or expression B is true	`(20 == 10) || (10 > 5)` returns **TRUE** `(20 == 10) || (10 < 5)` returns **FALSE**
!	Logical NOT operator !A returns true if expression A is false. It returns false if expression A is true.	`!(20 == 10)` returns **TRUE** `!(10 == 10)` returns **FALSE**

Other Useful operators

These are other operators that you might want to use in your Survey Solutions instrument.

Operator	Description	Example
?:	Conditional Expression/ The condition must evaluate to true or false. If condition is true, the *first expression* is evaluated and becomes the result. If condition is false, the *second expression* is evaluated and becomes the result. Only one of the two expressions is evaluated.	`(10 < 2)? a:b` will return b `(10 > 2)? a:b` will return a

Functions

f(x)

In C#, a function is a way of packaging code that does something and then returns the value.

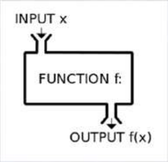
❖Functions are ready-made expression components that can be used by questionnaire designers for common tasks in validation and enabling conditions;

❖Designers don't have to use them or know all of them; they are shortcuts for common tasks, which in some cases can be done in standard C# (though commonly with longer expressions);

❖Functions allow performing tasks, which would be different to achieve by writing expressions.

Functions

❖Functions transform one kind of information into different, for example dates into number of years, or coordinates into kilometers;



❖Black box concept: most of the users don't care how the function is implemented;

❖Users <u>do need to know</u> the inputs and output of the function!

Functions

f(x)

❖Functions consist of function name and arguments in parentheses, here **f** is a function name, and **x** is one or more arguments (multiple arguments are separated by commas);

❖ Arguments can be questions from the questionnaire, constants.
For example: IsAnswered(variableName), InList(2,9,88).

❖Arguments have types;
For example: variableName.InRange(1900,2016), arguments could be only **long** or **double**.

❖Functions have types (type of result).
For example: variableName.InRange(1900,2016) result of this function is **bool** type

Functions

❖Some functions can be called as extensions to questions (like methods):
variableName.Contains(5) this function checks whether the value ***5*** is among the answers to a **variableName** – that is, is contained in the set of answers.
Returns *true* if ***5*** is contained in **variableName**'s answers. Returns *false* otherwise.

❖Some functions can only be called as standalone:
IsDate(YearDate, MonthDate, DayDate) is *true* if the three specified arguments comprise a valid date.
Example: assume you have a series of 3 numeric questions asking for a household members date of birth, and you want check that the date recorded is a valid date.
The syntax for the validation condition would be:
IsDate(YearDate, MonthDate, DayDate)

Types compatibility

❖Arguments must match function's requirements.
For example: FullYearsBetween(date, ~~string~~)

❖In some cases (e.g. constants) types can be converted by the C# automatically, e.g. if the argument must be double, but a long integer is specified.

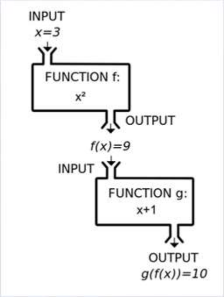
❖If the argument is of incompatible type, the compilation error will be shown.

❖Explicit types conversion can be used in some cases: F((type)arg).

Live Demo: IsDate()/new Date()

Functions

Functions have result types, which must be taken into account when the result of the function is used as an argument for another function.



Functions' groups

❖Numeric: InRange(), InList();

❖String: Left(), Right(), ConsistsOf();

❖Lists: ContainsAll(), ContainsAny(), ContainsOnly(), etc;

❖Date and time management: CenturyMonthCode(), FullYearsBetween(), etc

❖Geolocation: GpsDistance(), GpsDistanceKm(), etc;

❖Other/Miscelleneous

Most functions require arguments, functions listed here are shown without arguments.

Functions: use

❖Some functions are conveniently of Boolean type: IsAnswered(), IsNumber(), ContainsAny(), etc, which allows them to be used in the expressions for enabling, filtering and validation;

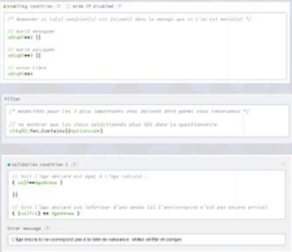
❖Some functions are of other type, and must be used as part of a bigger expression, which must be of Boolean type, for example: poinB.GpsDistanceKm(pointA)<30

Questions

1. What are the possible values of **bool?** type?
2. What does value null means in Survey Solutions?
3. For what components you shouldn't use relational operators?
4. Is it true that argument of a function can be any type? And why?

Summary

So what does the programming language do?



Enabling condition

```
/* demander si le(s) conjoint(s) vit (vivent) dans le ménage que si l'on est marié(e) */
// [illegible]
[illegible] ||
// [illegible]
[illegible] ||
// [illegible]
[illegible]
```

Filter

```
/* [illegible] */
// [illegible]
[illegible].Contains([illegible])
```

Validation condition 1

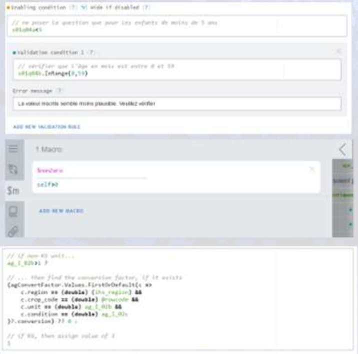
```
// [illegible]
( self==[illegible] )
||
// [illegible]
( (self+1) == [illegible] )
```

Error message

L'âge inscrit ne correspond pas à la date de naissance. Veuillez vérifier et corriger

- Enables objects in the questionnaire
  - « Skip » sections, sub-sections, or non-relevant questions
  - Limit available answer options
- Evaluate answers
  - Internal consistency
  - Plausibility
- Accomplish intermediary tasks
  - Consult lookup tables
  - Define the value of variables

Summary



Enabling condition

```
// ne poser la question que pour les enfants de moins de 5 ans
s01q04a<5
```

Validation condition 1

```
// vérifier que l'âge en mois est entre 0 et 59
s01q04b.InRange(0,59)
```

Error message

La valeur inscrite semble moins plausible. Veuillez vérifier

```
$isoZero
self>0
```

```
// if non-KG unit...
ag_I_02b>1 ?

// ... then find the conversion factor, if it exists
(agConvertFactor.Values.FirstOrDefault(c =>
    c.region == (double) (lhs_region) &&
    c.crop_code == (double) @rowcode &&
    c.unit == (double) ag_I_02b &&
    c.condition == (double) ag_I_02c
)?.conversion) ?? 0 :

// if KG, then assign value of 1
1
```

Where to use it?

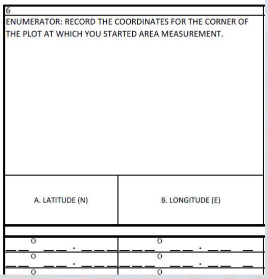
- Enablement conditions
  - Of questions
  - Of answer options
  - Of sections
  - Of static text
  - Of rosters
- Validation conditions
- Resources for these conditions
  - Macroses
  - Variables

Novel question types

Survey Solutions
Designer

GPS question

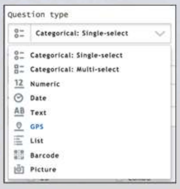
GPS question on a paper



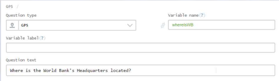
6
ENUMERATOR: RECORD THE COORDINATES FOR THE CORNER OF THE PLOT AT WHICH YOU STARTED AREA MEASUREMENT.

A. LATITUDE (N)	B. LONGITUDE (E)
o	o
o	o
o	o

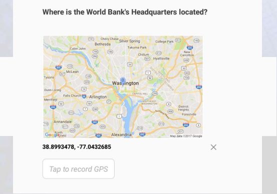
A GPS question expects a set of geographic coordinates (latitude, longitude, accuracy, altitude), which identify the location of the tablet. This type of question can be answered using a GPS-enabled tablet , internet connection is not required.


Question type
Categorical: Single-select
Categorical: Single-select
Categorical: Multi-select
Numeric
Date
Text
GPS
List
Barcode
Picture

GPS question



GPS /
Question type: GPS
Variable name: whereIsWB
Variable label
Question text: Where is the World Bank's Headquarters located?



Where is the World Bank's Headquarters located?

38.8993478, -77.0432685

Barcode

A **Barcode** question expects an optical machine-readable representation of data relating to an object.

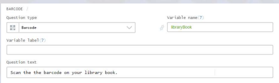
➢Note that there are many different standards of barcodes, with different capabilities and appearances. Survey Solutions will try to automatically detect the type of the barcode.
➢Questionnaire developers need to test the system using an example of the actual barcodes to be scanned to ensure compatibility.
➢Autofocus capability on the tablet is essential for barcode recognition to work properly.

Barcode question looks different on CAPI and CAWI.

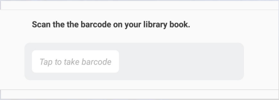
✓On CAPI you will be able to scan the Barcode with a tablet's camera.

✓On CAWI you will have a field where you can enter a code.

Barcode



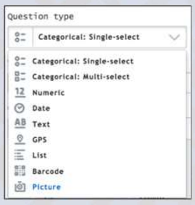
BARCODE /
Question type: Barcode
Variable name: libraryBook
Variable label
Question text: Scan the the barcode on your library book.



Scan the the barcode on your library book.

Picture questions

The **Picture** question captures binary files. You can use this question type to take a photo of any object (e.g. national id cards or other objects for a survey collecting prices) and person (e.g. pictures of interviewees like employees or household members).


Question type
Categorical: Single-select
Categorical: Single-select
Categorical: Multi-select
Numeric
Date
Text
GPS
List
Barcode
Picture

A picture type question can be used to capture signatures on a tablet. For this, the flag "***use signature pad***" should be set in the questionnaire Designer.

A picture types questions look different on CAPI and CAWI.
✓In the CAPI Picture type question permits uploading an image (selecting one from the tablet's gallery) or taking a photo directly.
✓In the CAWI surveys only selecting and uploading a file is possible.

Picture questions

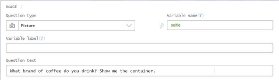


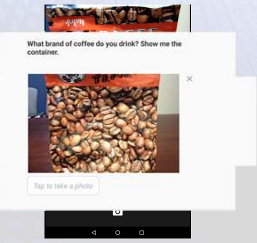
IMAGE /

Question type: Picture

Variable name(?): selfie

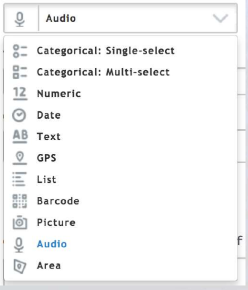
Variable label(?)

Question text: What brand of coffee do you drink? Show me the container.



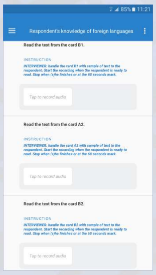
What brand of coffee do you drink? Show me the container.

Audio question



Audio question records sound using the tablet's microphone. This can be used in surveys where the recording of the respondent's voice may serve quality control purposes or be directly of interest to the researchers.

Audio question



Respondent's knowledge of foreign languages

Read the text from the card B1.

INSTRUCTION

INTERVIEWER: handle the card B1 with sample of text to the respondent. Start the recording when the respondent is ready to read. Stop when (s)he finishes or at the 60 seconds mark.

Read the text from the card A2.

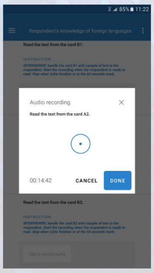
INSTRUCTION

INTERVIEWER: handle the card A2 with sample of text to the respondent. Start the recording when the respondent is ready to read. Stop when (s)he finishes or at the 60 seconds mark.

Read the text from the card B2.

INSTRUCTION

INTERVIEWER: handle the card B2 with sample of text to the respondent. Start the recording when the respondent is ready to read. Stop when (s)he finishes or at the 60 seconds mark.



Audio recording

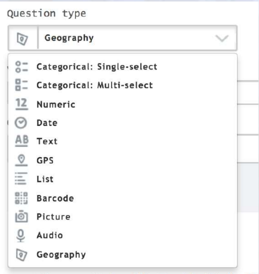
Read the text from the card A2.

00:14:42

- ➢After clicking "Tap to record Audio" button a timer and recording status will be displayed.
- ➢To stop the recording, tap on *Done*.
- ➢An audio question has a 180 seconds limit. After 180 seconds (3 min) the recording will stop as if *Done* was pressed and the 180 seconds will be saved automatically.
- ➢You can press on the play button to listen to the recording.

Live demo: novel question types

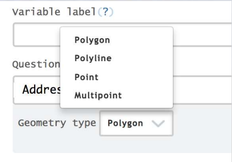
Geography questions



Question type: Geography

A Geography question can capture various geographic information as listed below:

1. area (polygons),
2. paths (polylines),
3. single (point) and
4. multiple (multipoint)

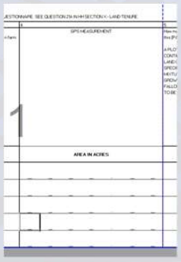


Variable label(?)

Geometry type: Polygon

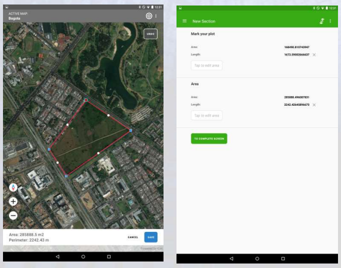
Geography questions

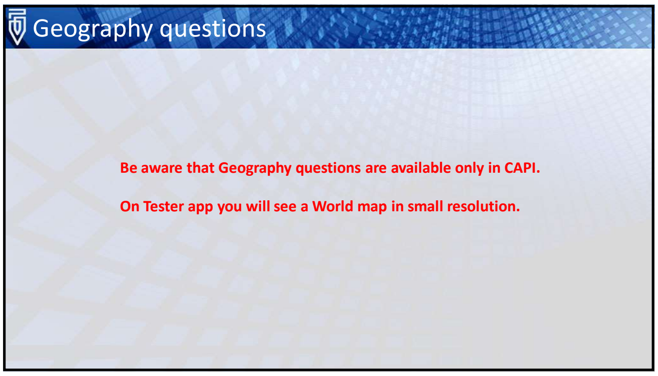
Geography question on a paper



GPS MEASUREMENT
AREA IN ACRES

Geography question on a tablet

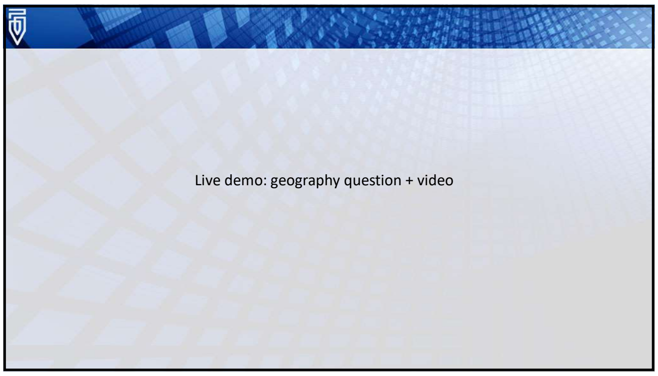




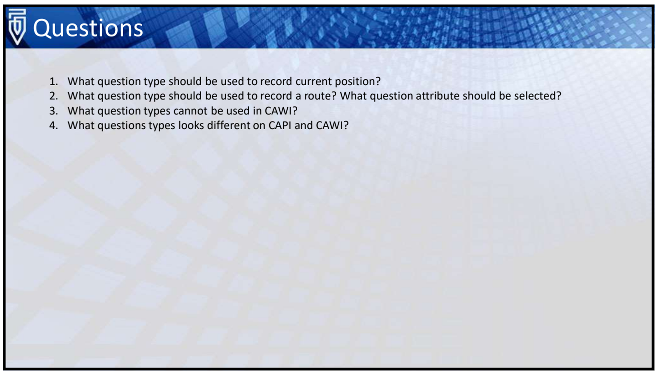
Geography questions

Be aware that Geography questions are available only in CAPI.

On Tester app you will see a World map in small resolution.

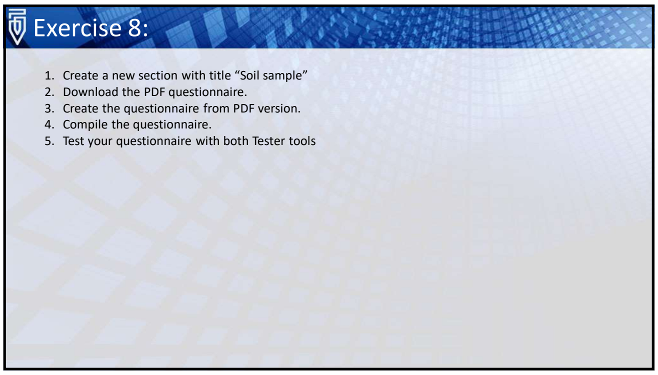


Live demo: geography question + video



Questions

1. What question type should be used to record current position?
2. What question type should be used to record a route? What question attribute should be selected?
3. What question types cannot be used in CAWI?
4. What questions types looks different on CAPI and CAWI?



Exercise 8:

1. Create a new section with title “Soil sample”
2. Download the PDF questionnaire.
3. Create the questionnaire from PDF version.
4. Compile the questionnaire.
5. Test your questionnaire with both Tester tools

Sections: 13, Sub-sections: 36,
Questions: 124.
Questions with enabling conditions: 16
Questions with validation conditions:8
Rosters: 16
Variables: 9

Survey
Solutions

Romania Beginners Examples

SURVEY IDENTIFICATION INFORMATION
QUESTIONNAIRE DESCRIPTION

BASIC QUESTIONS' TYPES
Sub-sections: 4, No rosters, Questions: 11, Static texts: 13.

CATEGORICAL QUESTIONS
Sub-sections: 4, No rosters, Questions: 14, Static texts: 15.

ROSTERS
Sub-sections: 4, Rosters: 4, Questions: 14.

ROSTER DISPLAY MODES + NESTED ROSTER
Sub-sections: 4, Rosters: 6, Questions: 16.

NOVEL QUESTION TYPES
Sub-sections: 5, No rosters, Questions: 9, Static texts: 9.

SYNTAX AND FUNCTIONS
Sub-sections: 3, No rosters, Questions: 7, Static texts: 3, Variables: 4.

ENABLING AND VALIDATION CONDITIONS
Sub-sections: 5, Rosters: 2, Questions: 23.

MACRO & VARIABLES
No sub-sections, Rosters: 1, Questions: 7, Static texts: 2, Variables: 5.

FILTERS
Sub-sections: 3, Rosters: 2, Questions: 10.

FORMATTING, ATTACHMENTS, AND SUBSTITUTIONS
Sub-sections: 2, No rosters, Questions: 2, Static texts: 5.

SURVEY IDENTIFICATION INFORMATION QUESTIONNAIRE DESCRIPTION

Basic information

Title	Romania Beginners Examples

BASIC QUESTIONS' TYPES

STATIC TEXT

"According to Law no. 226/ 2009 updated on the organisation and functioning of the Romanian official statistics stipulating:
- “This law is applicable to all the natural and legal resident and non-resident in Romania, carrying out activities on the Romanian territory.”
- “The data providers are obliged to transmit, to the official statistics producers, free of charge, reliable, updated and complete data, by observing the terms, periodicity, the format and collection method mentioned in the Annual National Statistical Programme and in compliance with the methodological norms.
The statistical survey is conducted in conformity with Regulation (EU) no 2018/ 1091 of the European Parliament and Council of 18 July 2018 on integrated farm statistics and repealing the Regulation (EU) no 1166/2008 and (EU) no 1337/2011.

BASIC QUESTIONS' TYPES

TEXT QUESTIONS

STATIC TEXT

Text questions capture alpha-numeric strings. In their simplest form, they are open string questions. In a more advanced form, they impose a structure on strings.

What is your name?	TEXT	name

STATIC TEXT

Text that follows a designer-specified pattern

What is your phone number?	TEXT	phone_number

BASIC QUESTIONS' TYPES

NUMERIC QUESTIONS

STATIC TEXT

Numeric questions capture open-ended numeric data (e.g., age, quantity of food product consumed, monetary expenditure, etc.). Survey Solutions has a standard numeric question and a few variants.

STATIC TEXT

Integers

What year were you born?	NUMERIC: INTEGER _ .	yearOfBirth
What is the area of owner farming?	NUMERIC: INTEGER _ .	owner_farming

STATIC TEXT

Real numbers, with a designer-specified number of maximum decimal places

What is the utilised agricultural area? (Hectares)	NUMERIC: DECIMAL _ .	utilised_area

STATIC TEXT

Integer or real values with a thousands separator. This separator aids readability of large numbers (e.g., currency values).

What is the price of Tesla car in Romanian leu?	NUMERIC: DECIMAL price _ .

BASIC QUESTIONS' TYPES

DATE QUESTIONS

Start of the interview	DATE: CURRENT TIME start ....

STATIC TEXT

Timestamp questions capture the current time and date--that is, the hour, minute, second, day, month, and year when the question is answered.

STATIC TEXT

Date questions capture a calendar date--that is, day, month, and year.

What is your date of birth?	DATE date_of_birth ....

STATIC TEXT

Date questions with preset date.

When did you submit your last tax form in 2019?	DATE tax_form ....

BASIC QUESTIONS' TYPES

LIST QUESTIONS

STATIC TEXT

List questions capture a series of text elements (e.g., names of members of a household, names of agricultural plots, etc.). List questions can be either of unrestricted length (with a system max of 40 elements) or of restricted length (where the max is designer-specified).

STATIC TEXT

List of unrestricted length

Please list all members of your household	LIST HHmembers ....

STATIC TEXT

List of designer-specified maximum length

List three your most favourite colors I List up to 3 colors	LIST color ....

CATEGORICAL QUESTIONS

CATEGORICAL QUESTIONS

CATEGORICAL QUESTIONS

CATEGORICAL QUESTIONS / CATEGORICAL QUESTIONS

CATEGORICAL SINGLE-SELECT

STATIC TEXT

Single-select questions capture the answers to close-ended questions with pre-coded options. The variants of this question type concern how the answer options are selected and whether answers to one single-select question affect the possible answers to a subsequent single-select question.

STATIC TEXT

Simple single-select with radio button answer selection

Gender	SINGLE-SELECT gender 01 ○ Male 02 ○ Female

STATIC TEXT

Single-select with combo box answer selection

What is the main crop on this plot?	SINGLE-SELECT: COMBO BOX mainCrop 1010 ○ BEANS/COWPEA 1040 ○ COCOYAM 1050 ○ COTTON 1060 ○ GROUND NUT/PEANUTS 1070 ○ GUINEA CORN/SORGHUM 1080 ○ MAIZE 1090 ○ MELON/EGUSI 1100 ○ MILLET/MAIWA 1110 ○ RICE 1121 ○ WHITE YAM 1122 ○ YELLOW YAM 1123 ○ WATER YAM 1124 ○ THREE LEAVE YAM 2010 ○ ACHA 2020 ○ BAMBARA NUT 2040 ○ BEENI-SEED/SESAME And 51 other symbols [2]

CATEGORICAL QUESTIONS / CATEGORICAL QUESTIONS

CATEGORICAL MULTI-SELECT

STATIC TEXT

Simple multi-select question

What type of documents does your household have for the land?

MULTI-SELECT doc

01 □ TITLE DEED

02 □ CERTIFICATE OF CUSTOMARY OWNERSHIP

03 □ CERTIFICATE OF OCCUPANCY

04 □ CERTIFICATE OF HEREDITARY ACQUISITION LISTED IN REGISTRY

05 □ SURVEY PLAN

06 □ RENTAL CONTRACT, REGISTERED

07 □ LEASE, REGISTERED

STATIC TEXT

Multi-select where answer order is recorded

What are the main difficulties that you experienced at your main work?

I Start from the most major one.

MULTI-SELECT: ORDERED `difficulties`

01 □ Difficulty getting a promotion

02 □ Difficulty getting a raise in salary

03 □ Being harassed at work

04 □ Difficulty traveling to/from work

05 □ Being assisgned tasks below level of education

STATIC TEXT

Multi-select with only designer-specified maximum number of answers possible

What do you usually do to make the water safer to drink?

I Select up to 3.

MULTI-SELECT `safeWater`

01 □ BOIL

02 □ ADD BLEACH/CHORINE

03 □ STRAIN THROUGH A CLOTH

04 □ USE WATER FILTER (CERAMIC/SAND/COMPOSITE/ETC.)

05 □ SOLAR DISINFECTION

06 □ LET IT STAND AND SETTLE

07 □ ALUM

STATIC TEXT

Combobox multi-select questions

Please select all crops that you have cultivated.

MULTI-SELECT `cultivatedCrops`

1010	□	BEANS/COWPEA
1040	□	COCOYAM
1050	□	COTTON
1060	□	GROUND NUT/PEANUTS
1070	□	GUINEA CORN/SORGHUM
1080	□	MAIZE
1090	□	MELON/EGUSI
1100	□	MILLET/MAIWA
1110	□	RICE
1121	□	WHITE YAM
1122	□	YELLOW YAM
1123	□	WATER YAM
1124	□	THREE LEAVE YAM
2010	□	ACHA
2020	□	BAMBARA NUT
2040	□	BEENI-SEED/SESAME

And 51 other symbols [3]

STATIC TEXT

Multi-select with only designer-specified maximum number of answers possible

Please select two main crops that grow.

MULTI-SELECT `twoMainCrops`

1010	□	BEANS/COWPEA
1040	□	COCOYAM
1050	□	COTTON
1060	□	GROUND NUT/PEANUTS
1070	□	GUINEA CORN/SORGHUM
1080	□	MAIZE
1090	□	MELON/EGUSI
1100	□	MILLET/MAIWA
1110	□	RICE
1121	□	WHITE YAM
1122	□	YELLOW YAM
1123	□	WATER YAM
1124	□	THREE LEAVE YAM
2010	□	ACHA
2020	□	BAMBARA NUT
2040	□	BEENI-SEED/SESAME

And 51 other symbols [4]

STATIC TEXT

Multi-select represented as a series of yes/no questions

Does your household have:

MULTI-SELECT: YES/NO `assets`

01 □ / □ Radio
02 □ / □ Television
03 □ / □ Mobile telephone
04 □ / □ Non-mobile telephone
05 □ / □ Refrigerator
06 □ / □ Cable TV
07 □ / □ Generating set
08 □ / □ Air conditioner
09 □ / □ Computer
10 □ / □ Electric iron
11 □ / □ Fan

STATIC TEXT

Multi-select represented as a series of yes/no questions where answer order is recorded

Has ... livestock has died in the last 12 month in your holding?

I Please start from bigger amount of a livestock that you lost

MULTI-SELECT: ORDERED, YES/NO `livestock`

10 □ / □ Bulls
11 □ / □ Oxen
12 □ / □ Cows
13 □ / □ Steers/Heifers
14 □ / □ Calves - Males/Females
15 □ / □ Buffaloes
20 □ / □ Goats - He/She/Kids
21 □ / □ Sheep - Rams/Ewes/Lambs
31 □ / □ Camels - He/She/Kids
41 □ / □ Pigs - Boar/Sow/Piglets
51 □ / □ Chicken - cocks / broilers
52 □ / □ Chicken - hens / layers
53 □ / □ Pullets/DOCs
54 □ / □ Other - Ducks, Geese, Guineafowls, etc
61 □ / □ Horses
62 □ / □ Mules / Donkeys

STATIC TEXT

Multi-select with only designer-specified maximum number of answers possible

What type of heat source do you use to heat your house?

I Select up to 3

MULTI-SELECT: YES/NO `heatSource`

01 □ / □ Central heating
02 □ / □ Electricity
03 □ / □ Natural gas
04 □ / □ Liquefied gas
05 □ / □ Oil and diesel
06 □ / □ Wood
07 □ / □ Manure

CATEGORICAL QUESTIONS / CATEGORICAL QUESTIONS

CATEGORICAL QUESTIONS WITH COLLECTION OF CATEGORIES

STATIC TEXT

Simple single-select with radio button answer selection

What is your favorite fruit?

SINGLE-SELECT Q1

01 ○ Apple
02 ○ Orange
04 ○ Peach
05 ○ Apricot
06 ○ Tangerine
07 ○ Papaya
08 ○ Plum
09 ○ Grapefruit

STATIC TEXT

Combobox multi-select questions

What fruit does your family consume most of the time?

MULTI-SELECT `fruitConsumption`

01 □ Apple
02 □ Orange
04 □ Peach
05 □ Apricot
06 □ Tangerine
07 □ Papaya
08 □ Plum
09 □ Grapefruit

STATIC TEXT

Combobox multi-select questions with maximum number of answers

What juice do you like?

I Select up to 2

MULTI-SELECT `juice`

01 □ Apple
02 □ Orange
04 □ Peach
05 □ Apricot
06 □ Tangerine
07 □ Papaya
08 □ Plum
09 □ Grapefruit

STATIC TEXT

Multi-select represented as a series of yes/no questions

Do you grove any ... trees?

MULTI-SELECT: YES/NO `fruitTrees`

01 □ / □ Apple
02 □ / □ Orange
04 □ / □ Peach
05 □ / □ Apricot
06 □ / □ Tangerine
07 □ / □ Papaya
08 □ / □ Plum
09 □ / □ Grapefruit

ROSTERS

ROSTERS

FIXED ROSTER

ROSTERS / FIXED ROSTER

Roster: ASSETS

generated by fixed list

assetsRoster

01	Owner occupied House
02	Other Buildings
03	Non-agricultural land
04	Furniture/Furnishings
05	Household Appliances e.g. Kettle, Flat iron, etc
23	Cooker
24	Refrigerator
25	Washing machine/Driers
06	Television
26	Radio
27	Home theatre / music system
07	Cassette/DVD/CD
08	Generators
09	Solar panel/electric inverters
10	Bicycle
11	Motor cycle
12	Motor vehicle
13	Boat /Canoe
14	Other Transport equipment
15	Jewelry and Watches
28	Fixed phone
16	Mobile phone
17	Computer - Desktop/Laptop/Tablet/iPad

Does any member of your household own %rostertitle% at present?	SINGLE-SELECT F01 01 ○ Yes 02 ○ No
How many %rostertitle%'s do(es) your household own at present?	NUMERIC: INTEGER F02 _________________________
What is the Total estimated value of the assets owned at present	NUMERIC: INTEGER F03 _________________________

ROSTERS

LIST QUESTION ROSTER

Please give me the names of the persons who usually live in your household and guests of the household who stayed here last night, starting with the head of the household.	LIST	L01

ROSTERS / LIST QUESTION ROSTER

Roster: MEMBER

generated by list question L01 HouseholdRoster

Sex	SINGLE-SELECT 01 ○ Male 02 ○ Female	L02
How old is %rostertitle%?	NUMERIC: INTEGER _ .	L03
What is %rostertitle%'s present marital status?	SINGLE-SELECT 01 ○ MONOGAMOUS MARRIED OR NON-FORMAL UNION 02 ○ SEPARATED 03 ○ DIVORCED 04 ○ WIDOW OR WIDOWER 05 ○ NEVER MARRIED	L04

ROSTERS

MULTI-SELECT QUESTION ROSTER

Do you have any of the following housing utilities and communication means?	MULTI-SELECT: YES/NO 01 □ / □ Centralized water supply 02 □ / □ Hot running water (tank, Ariston, geyser) 03 □ / □ Sewage (Centralized sanitation compound) 04 □ / □ Septic tank (Local sanitation compound /hole with waste products) 05 □ / □ Outside toilet 06 □ / □ Centralized gas supply 07 □ / □ Bathtub or shower 08 □ / □ Kitchen 09 □ / □ Electricity 10 □ / □ Internet Connection	M01

ROSTERS / MULTI-SELECT QUESTION ROSTER

Roster: UTILITIES

generated by multi-select question M01 utilitiesRoster

Does the %rostertitle% work?	TEXT	M02

ROSTERS

NUMERIC ROSTER

How many times in the last 6 months have you visited a health care provider?	NUMERIC: INTEGER _	N01

ROSTERS / NUMERIC ROSTER

Roster: HEALTH PROVIDER

generated by numeric question N01

healthProviderRoster

What was the name of the doctor?	TEXT	N02
What was the date of the visit?	DATE	N03
How long did your visit last? (Minutes)	NUMERIC: INTEGER _	N04
Did you get a medicine prescription at the end of the visit?	SINGLE-SELECT 01 ○ Yes 02 ○ No	N05

ROSTER DISPLAY MODES + NESTED ROSTER

ROSTER DISPLAY MODES + NESTED ROSTER

FLAT ROSTER MODE

Do you have bovine animals ..?

MULTI-SELECT: YES/NO FL01

01 □ / □ Bovine animals less than 1 year old
02 □ / □ Male, from 1 to 2 years old
03 □ / □ Heifers, from 1 to 2 years old
04 □ / □ Male, 2 years old and over
05 □ / □ Heifers, 2 years old and over
06 □ / □ Dairy cows, 2 years old and over
07 □ / □ Dairy Bufalo cows, 2 years old and over
08 □ / □ Female Non-dairy cows, 2 years old and over
09 □ / □ Female Non-dairy Bufalo cows, 2 years old and over

ROSTER DISPLAY MODES + NESTED ROSTER / FLAT ROSTER MODE

Roster: ANIMALS

generated by multi-select question FL01 FLRoster

How many %rostertitle% do you have?

NUMERIC: INTEGER FL02

_ _

How many %rostertitle% that you have belongs to someone else?

NUMERIC: INTEGER FL03

_ _

ROSTER DISPLAY MODES + NESTED ROSTER

TABLE ROSTER MODE

How many people works for you?

NUMERIC: INTEGER T01

_ _

ROSTER DISPLAY MODES + NESTED ROSTER / TABLE ROSTER MODE

Roster: WORKER

generated by numeric question T01 workerRoster

Full name of the worker

TEXT T02

....

Age

NUMERIC: INTEGER T03

_ _

ROSTER DISPLAY MODES + NESTED ROSTER

MATRIX ROSTER MODE

ROSTER DISPLAY MODES + NESTED ROSTER / MATRIX ROSTER MODE

Roster: HELMET

generated by fixed list helmetRoster

01 When riding a bike

02 When driving a motorbike

03 When riding an electric scooter

When you drive or ride a bike, motorcycle, or electric scooter, how often do you wear a helmet?	SINGLE-SELECT MT01 001 ○ Always 002 ○ Often 003 ○ Sometimes 004 ○ Rarely 005 ○ Never 999 ○ N/A

ROSTER DISPLAY MODES + NESTED ROSTER

NESTED ROSTER

Please list all parcels that you have	LIST NE01 ....

ROSTER DISPLAY MODES + NESTED ROSTER / NESTED ROSTER

Roster: PARCEL

generated by list question NE01 NE02

What is the area of %rostertitle%? (Hectares)	NUMERIC: DECIMAL NE03 _ .
Who owns this parcel?	TEXT NE04 ....
How many plots within the %rostertitle%?	NUMERIC: INTEGER NE05 _ .

ROSTER DISPLAY MODES + NESTED ROSTER / NESTED ROSTER / PARCEL

Roster: PLOT

generated by numeric question NE05 NE06

Description of the plot	TEXT NE07 ....
Area	NUMERIC: DECIMAL NE07_1 _ .

What crops do you grow on this plot?

MULTI-SELECT NE08

1010 □ BEANS/COWPEA
1040 □ COCOYAM
1050 □ COTTON
1060 □ GROUND NUT/PEANUTS
1070 □ GUINEA CORN/SORGHUM
1080 □ MAIZE
1090 □ MELON/EGUSI
1100 □ MILLET/MAIWA
1110 □ RICE
1121 □ WHITE YAM
1122 □ YELLOW YAM
1123 □ WATER YAM
1124 □ THREE LEAVE YAM
2010 □ ACHA
2020 □ BAMBARA NUT
2040 □ BEENI-SEED/SESAME

And 24 other symbols [5]

ROSTER DISPLAY MODES + NESTED ROSTER / NESTED ROSTER / PARCEL / PLOT

Roster: CROP

generated by multi-select question NE08

NE09

Did you apply pesticides on this %rostertitle%

SINGLE-SELECT NE10

01 ○ Yes
02 ○ No

Did your household sell any unprocessed %rostertitle% since the harvest?

SINGLE-SELECT NE11

01 ○ Yes
02 ○ No

NOVEL QUESTION TYPES

NOVEL QUESTION TYPES

GPS QUESTION

STATIC TEXT

GPS questions automatically capture the following data with a simple click: longitude, latitude, altitude, accuracy, and satellite time stamp.

GPS location of the household	GPS `location` _______________ N _______________ W _______________ A

NOVEL QUESTION TYPES

BARCODE

STATIC TEXT

Barcode questions capture the data behind most types of barcode, from simple product barcodes to data-dense barcodes on many national ID cards.

Scan the barcode of your favourite book	BARCODE `book`

NOVEL QUESTION TYPES

PICTURE QUESTIONS

STATIC TEXT

Image questions use the tablet's camera to capture images. Not to be confused with embedded images that are static parts of the questionnaire.

STATIC TEXT

Image question

Picture of the ID	PICTURE `idPicture`
Sign if you are agree to participate in the survey	PICTURE `sign`

NOVEL QUESTION TYPES

AUDION QUESTION

STATIC TEXT

Audio can be used in surveys where the recording of the respondent’s voice may serve quality control purposes or be directly of interest to the researchers.

Read the text from the card A1 I Interviewer: handle the card A1 with sample of text to the respondent. Srart the recording when the respondent is ready to read. Stop when s (he) finishes of at the 60 seconds mark.	AUDIO	`audio`

NOVEL QUESTION TYPES

GEOGRAPHY QUESTIONS

STATIC TEXT

Polygon geography question

Show me the boundaries of the parcel on which your home is located!	GEOGRAPHY	`parcel`

STATIC TEXT

Polyline geography question

Please show me the route which your child take to school	GEOGRAPHY	`route`

STATIC TEXT

Point geography question

Show me where is the closest hospital for you	GEOGRAPHY	`point`

STATIC TEXT

Multipoint geography question.

Please show me all postal offices in the area	GEOGRAPHY	`multipoint`

SYNTAX AND FUNCTIONS

SYNTAX AND FUNCTIONS

GPS CONSTUCTOR

Current location

GPS `locationCurrent`

V1 `distance <= 800`

M1 Your current location is further than 800m from National Statistics Office

N

W

A

VARIABLE

`(long)(new GeoLocation(44.429717, 26.093319, 0, 0) .GpsDistance(locationCurrent))`

LONG `distance`

STATIC TEXT

Distance from National Statistics Office %distance%m

SYNTAX AND FUNCTIONS

OPERATIONS WITH LIST TYPE

Respondent name

TEXT `respondent`

Head of household

TEXT `head`

Make a complete list of household members. Start with the household head

LIST `MembersList`

V1 `IsAnswered(head) ? (listOfMembers[0].Text == head) : true`

M1 The head (%head%) isn't the first listed member or is missing. Please revise or leave a comment

W2 `IsAnswered(respondent) ? (listOfMembers.Any(x=>x.Text == respondent)) : true`

M2 The respondent (%respondent%) isn't listed or is missing. Please revise or leave a comment

VARIABLE

`MembersList[0].Text`

STRING `headName`

STATIC TEXT

First person from the list %headName%

SYNTAX AND FUNCTIONS

ISDATE FUNCTION

year

NUMERIC: INTEGER `year`

month

NUMERIC: INTEGER `month`

day	NUMERIC: INTEGER `day`
VARIABLE `IsDate(year, month, day)`	BOOLEAN `isItDate`
VARIABLE `new DateTime(year??1900,((month??0)<= 12 ? month??0 : 1) ,day??1)`	DATETIME `newDate`

STATIC TEXT

Can be date created from numbers ? - %isItDate%

Created date or default - %newDate%

ENABLING AND VALIDATION CONDITIONS

ENABLING AND VALIDATION CONDITIONS

ENABLING CONDITIONS EXAMPLE

1. How old are you?	NUMERIC: INTEGER age ____________________
2. What is your marital status? E `age > 15`	SINGLE-SELECT maritalStatus 01 ○ Never married 02 ○ Married (monogamous) 03 ○ Married (polygamous) 04 ○ Divorced/separated 05 ○ Widowed
3. What is your employment status? E `age > 15`	SINGLE-SELECT employment 01 ○ Employee 02 ○ Self-employed 03 ○ Unemployed 04 ○ Outside the labour force
4. How many time per day do you cook?	TEXT Q04 ____________________
Household location	GPS hhLocation ____________________ N ____________________ W ____________________ A

ENABLING AND VALIDATION CONDITIONS

SINGLE-SELECT

19. What is [Name]'s marital status?	SINGLE-SELECT q19 01 ○ Monogamous married 02 ○ Polygamous married 03 ○ Living together 04 ○ Separated 05 ○ Divorced 06 ○ Never Married 07 ○ Widow(er)
20. What is [Name]'s previous marital status before this current marriage? E `//q19 == 1 || q19 == 2 || q19 ==5 q19.InList(1,2,5)`	SINGLE-SELECT q20 01 ○ Never married 02 ○ Previously divorced 03 ○ Previously widowed 04 ○ Multiple Previous marriages

4. How was this plot acquired?	SINGLE-SELECT 01 ○ Outright purchase 02 ○ Rented for cash of in-kind goods from other households 03 ○ Used free of charge 04 ○ Distributed by community 05 ○ family inheritance	q4
5. How much in total was paid for this plot (include both cash and payments in kind)? E `q4 == 1`	NUMERIC: INTEGER	q5
6. Who is/are the owner/s of this plot? E `//q4 == 1 || q4 == 4 || q4 == 5 q4.InList(1,4,5)`	LIST	q6
7. Have you or any other hh member acquired a LEGAL TITLE that verifies the Rights of Occupance to this plot? E `//q4 == 1 || q4 == 4 || q4 == 5 q4.InList(1,4,5) //q4.IsNoneOf(2,3)`	SINGLE-SELECT 01 ○ Yes 02 ○ No	q7
What is your main source of cooking fuel?	SINGLE-SELECT 01 ○ Collected firewood 02 ○ Purchased firewood 03 ○ Paraffin 04 ○ Electricity 05 ○ Gas 06 ○ Charcoal 07 ○ Crop residue 08 ○ Saw dust 09 ○ Animal waste 10 ○ Other (specify)	f12
Please specify the Other E `f12 == 10`	TEXT	f12_oth
Do you ever use firewood for fuel? E `//f12.InRange(3,10) f12.IsNoneOf(1,2)`	SINGLE-SELECT 01 ○ Yes 02 ○ No	f13
Do you ever collect firewood? E `f13 == 1 || f12 == 2`	SINGLE-SELECT 01 ○ Yes 02 ○ No	f14

ENABLING AND VALIDATION CONDITIONS

CONDITIONS IN ROSTERS

Make a complete list of household members. Start with the household head	LIST	listOfMembers

ENABLING AND VALIDATION CONDITIONS / CONDITIONS IN ROSTERS

Roster: HOUSEHOLD ROSTER

generated by list question `listOfMembers` HHroster

1. SEX

SINGLE-SELECT hh_q01

01 ○ MALE
02 ○ FEMALE

2. RELATIONSHIP TO HEAD:

V1
```
// Conditional expression:   // Is this person the house
hold head? //hh_q02 == 1 ? // If household head, check t
hat there is only one household head listed //(HHroster.
Count(x=>x.hh_q02
```
And 327 other symbols [1]

M1 There must be only one person in the household designated as head.

V2
```
// Has relationship to head been answered for all househ
old members? HHroster.All(x=>x.hh_q02!=null) ?  // If al
l information has been filled out, check for a head was
listed !(HHroster.C
```
And 101 other symbols [1]

M2 There is no household head in the household

W3
```
// If head of household, check that no spouse has the sa
me sex as the head self == 2 ? HHroster.Count(x=>x.hh_q0
2==1 && x.hh_q01==hh_q01)==0 : // If spouse of head, che
ck that that no head has the
```
And 148 other symbols [1]

M3 Unlikely answer. It's rare that the head of household and his/her spouse have the same sex.

SINGLE-SELECT hh_q02

01 ○ HEAD
02 ○ WIFE/HUSBAND
03 ○ CHILD/ADOPTED CHILD
04 ○ GRANDCHILD
05 ○ NIECE/NEPHEW
06 ○ FATHER/MOTHER
07 ○ SISTER/BROTHER
08 ○ SON/DAUGHTER-IN-LAW
09 ○ BROTHER/SISTER-IN-LAW
10 ○ GRANDFATHER/MOTHER
11 ○ FATHER/MOTHER-IN-LAW
12 ○ OTHER RELATIVE
13 ○ SERVANT OR SERVANT'S RELATIVE
14 ○ LODGER/LODGER'S RELATIVE
15 ○ OTHER NON-RELATIVE
16 ○ OTHER (SPECIFY)

3. Age

NUMERIC: INTEGER hh_q03

_ _

ENABLING AND VALIDATION CONDITIONS / CONDITIONS IN ROSTERS

HEALTH

E
```
/* Enable only if there are any women 15-49 yo in the household */ //HHroster.Any(x=>x.hh_q01 == 2 && x.hh_q03>=15 &
& x.hh_q03<=49) HHroster.Any(x=>x.hh_q01 == 2 && x.hh_q03.InRange(15,49))
```

4. During the past 2 weeks has anybody suffered from an illness or injury?

SINGLE-SELECT hh_d04

01 ○ YES
02 ○ NO

5. What was the illness or injury?

I LIST UP TO TWO OPTIONS

E hh_d04==1

MULTI-SELECT: ORDERED hh_d05

01 □ FEVER, MALARIA
02 □ DIARRHEA
03 □ STOMACH ACHE
04 □ VOMITING
05 □ SORE THROAT
06 □ UPPER RESPIRATORY (SINUSES)
07 □ LOWER RESPIRATORY(CHEST, LUNGS)
08 □ FLU
09 □ ASTHMA
10 □ HEADACHE
11 □ FAINTING
12 □ SKIN PROBLEM
13 □ DENTAL PROBLEM
14 □ EYE PROBLEM
15 □ EAR/NOSE/THROAT
16 □ BACKACHE

And 14 other symbols [6]

ENABLING AND VALIDATION CONDITIONS

GENERATED VARIABLES

1. Does any member of this household own any following [CONSUMER DURABLE] at present, exclusively and/or jointly with someone else?	MULTI-SELECT: YES/NO 1101 □ / □ Cell phone 1102 □ / □ Computer 1103 □ / □ Bicycle 1104 □ / □ Motorcycle 1105 □ / □ Car 1106 □ / □ Tuk tuk 1107 □ / □ Boat 1108 □ / □ Tractor/Koryun	GV01

ENABLING AND VALIDATION CONDITIONS / GENERATED VARIABLES

Roster: DURABLES

generated by multi-select question GV01

GV_roster

How many %rostertitle% do you have? V1 `(@rowcode.InRange(1105,1108) && self.InRange(1,3)) || !@rowcode.InRange(1105,1108)` M1 The number of durables seems to be unlikely. Please revise.	NUMERIC: INTEGER _	GV02

MACRO &AMP; VARIABLES

Start section	DATE: CURRENT TIME	MaV00
What kind of dry pulses and protein crops for the production of grain does your holding grow .... ? E IsAnswered(MaV00)	MULTI-SELECT 11 □ Field peas 12 □ Beans 13 □ Sweet lupins 14 □ Other dried pulses (lentils, chick peas, broad beans etc.)	MaV01

MACRO & VARIABLES

Roster: CROP

generated by multi-select question MaV01 MaV_roster

How much have you paid for %rostertitle% seeds?	NUMERIC: DECIMAL - .	MaV02
What is the area of plot where %rostertitle% is planted? (sqm)	NUMERIC: INTEGER - .	MaV03
Have you applied any fertilizers on the %rostertitle%'s plot	SINGLE-SELECT 01 ○ Yes 02 ○ No	MaV04
What month have you harvested %rostertitle% last time? V1 harvestDate <= MaV00 M1 Month cannot be in the future	SINGLE-SELECT: COMBO BOX 01 ○ January 02 ○ February 03 ○ March 04 ○ April 05 ○ May 06 ○ June 07 ○ July 08 ○ August 09 ○ September 10 ○ October 11 ○ November 12 ○ December	MaV05
What Year have you harvested %rostertitle% last time? I Enter 4 digits year V1 //self.InRange(MaV00.Value.Year-2, MaV00.Value.Year) self.InRange($currentYear - 2, $currentYear) M1 Harvest year seems to be unikely	NUMERIC: INTEGER - .	MaV06
VARIABLE new DateTime(MaV06??($currentYear), MaV05??1,1)	DATETIME	harvestDate
VARIABLE harvestDate.Value.ToString("MM, yyy")	STRING	harvDate

STATIC TEXT

IsAnswered(MaV05) && IsAnswered(MaV06)

E *%rostertitle% was harvested on %harvDate%*

VARIABLE `MaV_roster.Sum(x=>x.MaV02??0)`	DOUBLE	`totalExpenses`
VARIABLE `MaV_roster.Where(x=>x.@rowcode!=14).Sum(x=>x.MaV03??0)`	LONG	`totalPlantedArea`
VARIABLE `MaV_roster.Any(x=>x.MaV04==1)`	BOOLEAN	`fertilizers`

STATIC TEXT

Total expenses on seeds were %totalExpenses%
Total crops' area planted is %totalPlantedArea%sqm
Fertilizers were applied on some plots - %fertilizers%

FILTERS

FILTERS
FILTERS IN SINGLE-SELECT

What are the sources of electricity that you use in your enterprise?	MULTI-SELECT FS00 001 □ National grid 002 □ Mini-grid 003 □ Electric generator 004 □ Solar Lantern 005 □ Solar Lighting System 006 □ Solar Home System 007 □ Rechargeable Battery 008 □ Dry-cell battery 111 □ No electricity
What is the main type of heat source do you use? F (FS00.ContainsAny(1,2,3) && @optioncode== 2) || @optioncode!= 2	SINGLE-SELECT FS02 01 ○ Central heating 02 ○ Electricity 03 ○ Natural gas 04 ○ Liquefied gas 05 ○ Oil and diesel 06 ○ Wood 07 ○ Manure 08 ○ Other

FILTERS
FILTER IN MULTI-SELECT

What is the present ownership status of this dwelling?	SINGLE-SELECT FM01 01 ○ Owned by someone in household 02 ○ Rented 03 ○ Free 96 ○ Other 98 ○ Don't know
What spances for a house have you paid last month? F FM01==2 && @optioncode==3 || @optioncode != 3	MULTI-SELECT FM02 01 □ Water charges 02 □ Electricity 03 □ Rent

FILTERS
FILTER IN A LINKED QUESTION

Make a complete list of household members. Start with the household head	LIST flq_01 ....

FILTERS / FILTER IN A LINKED QUESTION
Roster: HOUSEHOLD ROSTER
generated by list question flq_01 flq_roster

1. SEX

SINGLE-SELECT flq_02

01 ○ MALE

02 ○ FEMALE

2. RELATIONSHIP TO HEAD:

V1 `// Conditional expression:   // Is this person the household head? //flq_03 == 1 ? // If household head, check that there is only one household head listed //(flq_roster.Count(x=>x.flq_` And 331 other symbols [2]

M1 There must be only one person in the household designated as head.

V2 `// Has relationship to head been answered for all household members? flq_roster.All(x=>x.flq_03!=null) ?  // If all information has been filled out, check for a head was listed !(flq_rost` And 105 other symbols [2]

M2 There is no household head in the household

W3 `// If head of household, check that no spouse has the same sex as the head self == 2 ? flq_roster.Count(x=>x.flq_03==1 && x.flq_02==flq_02)==0 : // If spouse of head, check that that no head` And 162 other symbols [2]

M3 Unlikely answer. It's rare that the head of household and his/her spouse have the same sex.

SINGLE-SELECT flq_03

01 ○ HEAD

02 ○ WIFE/HUSBAND

03 ○ CHILD/ADOPTED CHILD

04 ○ GRANDCHILD

05 ○ NIECE/NEPHEW

06 ○ FATHER/MOTHER

07 ○ SISTER/BROTHER

08 ○ SON/DAUGHTER-IN-LAW

09 ○ BROTHER/SISTER-IN-LAW

10 ○ GRANDFATHER/MOTHER

11 ○ FATHER/MOTHER-IN-LAW

12 ○ OTHER RELATIVE

13 ○ SERVANT OR SERVANT'S RELATIVE

14 ○ LODGER/LODGER'S RELATIVE

15 ○ OTHER NON-RELATIVE

16 ○ OTHER (SPECIFY)

3. Age

NUMERIC: INTEGER flq_04

_ _

FILTERS / FILTER IN A LINKED QUESTION

Roster: HOUSEHOLD ROSTER'S DETAILS

generated by list question flq_01 flq_details_roster

E `flq_04.InRange(0,14)`

4. Does the father of %rostertitle% live in the household?

SINGLE-SELECT flq_05

01 ○ Yes

02 ○ No

5.Who is the %rostertitle%'s father?

F // select male flq_02==1 && // Cannot select his/herself as father @current.@rowcode!=@rowcode && // Show members 14 years older then current member (flq_04!=null ? (flq_04 - 14) >= @current.flq
And 13 other symbols [1]

E `flq_05 == 1`

SINGLE-SELECT: LINKED flq_06

FORMATTING, ATTACHMENTS, AND SUBSTITUTIONS

STATIC TEXT

Question texts and static-texts can be formatted with a series of html tags.
The html tags that can currently be used in Survey Solutions are described in this article.

Line break

Italic

Underline

`Teletype`

Size

Big

Small

Script

Subscript. $_{\text{Subscript}}$

Superscript. $^{\text{Superscript}}$

Color
Standard (case-insensitive) color names as per HTML 4.01 could be used

FORMATTING, ATTACHMENTS, AND SUBSTITUTIONS

HYPERLINKS

In which year have you moved to the city?	NUMERIC: INTEGER	FA01
V1 `self >= yearOfBirth`		
M1 Error year couldn't be earlier that year of [birth (%yearOfBirth%)](year OfBirth)		

STATIC TEXT

Resources used

Detailed structure and explanatory notes [ISIC Rev 4](https://unstats.un.org/home/)

Option filters have been added. Accordingly, please refer to the lookup table named isictable to see how the filter operates.

Note that the alpha codes for the Main Category have been replaced with numeric values in order to be compatiable with the software framework.

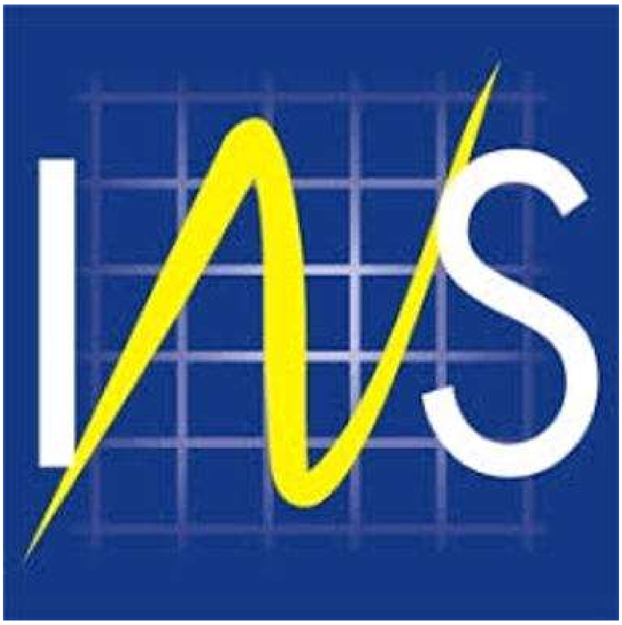
What is your [BMI index] (https://en.wikipedia.org/wiki/Body_mass_index)	NUMERIC: INTEGER	`bmi`

FORMATTING, ATTACHMENTS, AND SUBSTITUTIONS

ATTACHMENTS

STATIC TEXT

Image attachment



STATIC TEXT

PDF attachment

STATIC TEXT

Video attachment Advanced features

ADVANCED CATEGORICAL QUESTIONS

ADVANCED CATEGORICAL QUESTIONS

CASCADING QUESTIONS

County	SINGLE-SELECT: COMBO BOX `county` 010 ○ JUDEŢUL ALBA 029 ○ JUDEŢUL ARAD 038 ○ JUDEŢUL ARGEŞ 047 ○ JUDEŢUL BACÃU 056 ○ JUDEŢUL BIHOR 065 ○ JUDEŢUL BISTRIŢA-NÃSÃUD 074 ○ JUDEŢUL BOTOŞANI 083 ○ JUDEŢUL BRAŞOV 092 ○ JUDEŢUL BRÃILA 109 ○ JUDEŢUL BUZÃU 118 ○ JUDEŢUL CARAŞ-SEVERIN 127 ○ JUDEŢUL CLUJ 136 ○ JUDEŢUL CONSTANŢA 145 ○ JUDEŢUL COVASNA 154 ○ JUDEŢUL DÂMBOVIŢA 163 ○ JUDEŢUL DOLJ And 26 other symbols [7]
Municipality/ Commune/ Town	SINGLE-SELECT: CASCADING `municipality` 001017 ○ MUNICIPIUL ALBA IULIA 001071 ○ CIUGUD 001151 ○ ORAŞ ABRUD 001213 ○ MUNICIPIUL AIUD 001348 ○ MUNICIPIUL BLAJ 001455 ○ ORAŞ CÂMPENI 001696 ○ ORAŞ CUGIR 001794 ○ ORAŞ OCNA MUREŞ 001874 ○ MUNICIPIUL SEBEŞ 001936 ○ ORAŞ ZLATNA 002130 ○ ALBAC 002309 ○ ALMAŞU MARE 002381 ○ ARIEŞENI 002577 ○ AVRAM IANCU 002915 ○ ORAŞ BAIA DE ARIEŞ 002988 ○ BERGHIN And 3165 other symbols [8]

Component locality (village) (SIRUTA Code)

SINGLE-SELECT: CASCADING siruta

001026	○	ALBA IULIA
001035	○	BÃRÃBANŢ
001044	○	MICEŞTI
001053	○	OARDA
001062	○	PÂCLIŞA
001080	○	CIUGUD
001099	○	DRÂMBAR
001106	○	LIMBA
001115	○	HÃPRIA
001124	○	ŞEUŞA
001133	○	TELEAC
001160	○	ABRUD
001179	○	ABRUD-SAT
001188	○	GURA CORNEI
001197	○	SOHARU
001222	○	AIUD

And 13739 other symbols [9]

ADVANCED CATEGORICAL QUESTIONS

LINKED QUESTIONS

Please list all countries that you visited for last 12 months

I List up to 15

LIST LQ01

....

What was the last country that you visited?

E `LQ01.Length >2`

SINGLE-SELECT: LINKED LQ02

What countries have you visited for work?

E `IsAnswered(LQ01)`

MULTI-SELECT: LINKED LQ03

ADVANCED CATEGORICAL QUESTIONS / LINKED QUESTIONS

Roster: COUNTRY

generated by list question LQ01 LQ04_roster

E `LQ03.Contains(@rowcode)`

What was the date of the visit to %rostertitle%?

DATE LQ05

....

How long was your mission to %rostertitle%? (days)

NUMERIC: INTEGER LQ06

_ _

Which hotel have you stayed in?

TEXT LQ07

....

What was the last country that you visited for a mission?

F LQ06>=14

E `LQ04_roster.Count(x=>(x.LQ06??0)>=14)>1`

SINGLE-SELECT: LINKED LQ08

In which hotels brekfasts were included?	MULTI-SELECT: LINKED	LQ09
E `LQ04_roster.Any(x=>IsAnswered(x.LQ07))`		

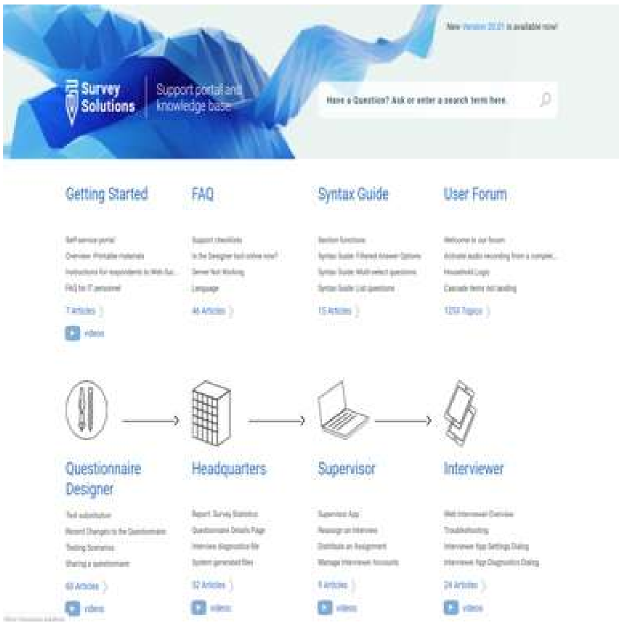
RECOURCES AND COMMUNICATION

STATIC TEXT

[Survey Solutions Portal](https://mysurvey.solutions/)

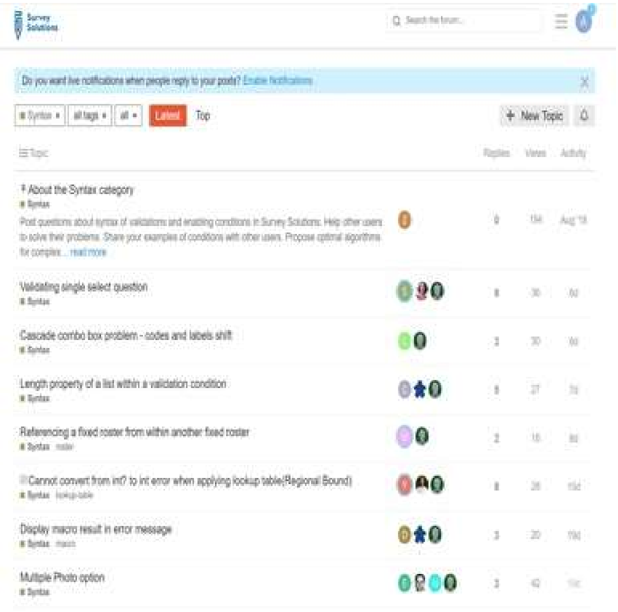
STATIC TEXT

[Support](https://support.mysurvey.solutions/)


New Version 20.01 is available now!
Survey Solutions
Support portal and knowledge base
Have a Question? Ask or enter a search term here.
Getting Started
Self-service portal
Overview: Printable materials
Instructions for respondents to Web Su...
FAQ for IT personnel
7 Articles
videos
FAQ
Support checklists
Is the Designer tool online now?
Server Not Working
Language
46 Articles
Syntax Guide
Section functions
Syntax Guide: Filtered Answer Options
Syntax Guide: Multi-select questions
Syntax Guide: List questions
15 Articles
User Forum
Welcome to our forum
Activate audio recording from a complet...
Household Logic
Cascade items not loading
1250 Topics
Questionnaire Designer
Text substitution
Recent Changes to the Questionnaire
Testing Scenarios
Sharing a questionnaire
60 Articles
videos
Headquarters
Report: Survey Statistics
Questionnaire Details Page
Interview diagnostics file
System generated files
32 Articles
videos
Supervisor
Supervisor App
Reassign an Interview
Distribute an Assignment
Manage Interviewer Accounts
9 Articles
videos
Interviewer
Web Interviewer Overview
Troubleshooting
Interviewer App Settings Dialog
Interviewer App Diagnostics Dialog
24 Articles
videos

STATIC TEXT

[Forum](https://forum.mysurvey.solutions/)



Survey Solutions

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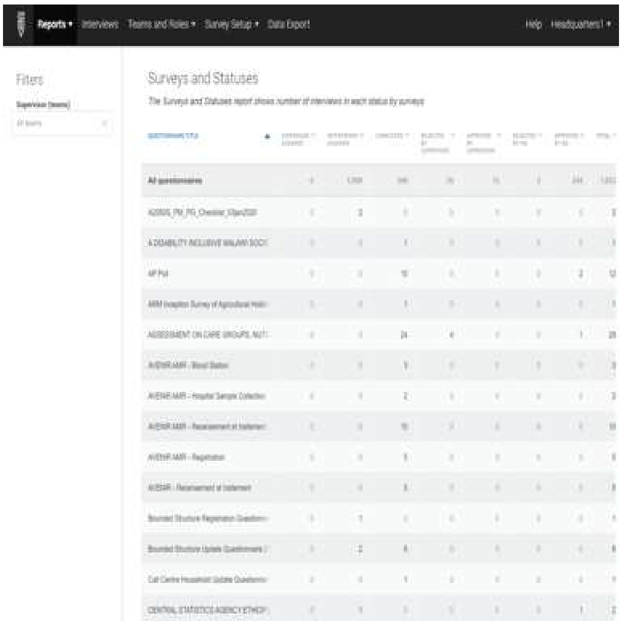
Syntax ▾ | all tags ▾ | all ▾ | Latest | Top | + New Topic

Topic		Replies	Views	Activity
About the Syntax category Syntax Post questions about syntax of validations and enabling conditions in Survey Solutions. Help other users to solve their problems. Share your examples of conditions with other users. Propose optimal algorithms for complex... read more		0	154	Aug '18
Validating single select question Syntax		8	30	6d
Cascade combo box problem - codes and labels shift Syntax		3	30	6d
Length property of a list within a validation condition Syntax		8	27	7d
Referencing a fixed roster from within another fixed roster Syntax roster		2	16	8d
Cannot convert from int? to int error when applying lookup table(Regional Bound) Syntax lookup-table		8	28	15d
Display macro result in error message Syntax macro		3	20	19d
Multiple Photo option Syntax		3	42	1m

STATIC TEXT

[Demo Server](https://demo.mysurvey.solutions/)



Reports ▾ Interviews Teams and Roles ▾ Survey Setup ▾ Data Export Help Headquarters1 ▾

Filters

Supervisor (teams)

All teams

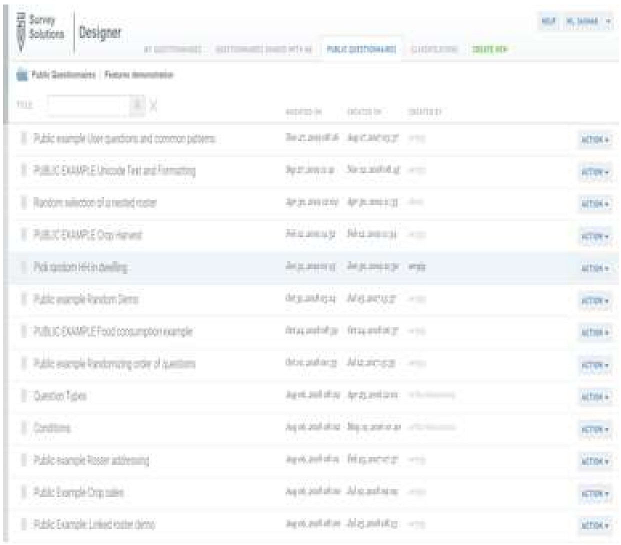
Surveys and Statuses

The Surveys and Statuses report shows number of interviews in each status by surveys

QUESTIONNAIRE TITLE	SUPERVISOR ASSIGNED	INTERVIEWER ASSIGNED	COMPLETED	REJECTED BY SUPERVISOR	APPROVED BY SUPERVISOR	REJECTED BY HQ	APPROVED BY HQ	TOTAL
All questionnaires	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
A2020_PM_PS_Checklist_03jan2020	[illegible]	2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	2
A DISABILITY INCLUSIVE MALAWI SOCI	[illegible]	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	1
AP Pvt	[illegible]	[illegible]	10	[illegible]	[illegible]	[illegible]	2	12
ARM Inception Survey of Agricultural Hold	[illegible]	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	1
ASSESSMENT ON CARE GROUPS, NUT	[illegible]	[illegible]	24	4	[illegible]	[illegible]	1	29
AVENIR AMR - Blood Station	[illegible]	[illegible]	3	[illegible]	[illegible]	[illegible]	[illegible]	3
AVENIR AMR - Hospital Sample Collection	[illegible]	[illegible]	2	[illegible]	[illegible]	[illegible]	[illegible]	3
AVENIR AMR - Reassessment at Settlement	[illegible]	[illegible]	10	[illegible]	[illegible]	[illegible]	[illegible]	10
AVENIR AMR - Registration	[illegible]	[illegible]	5	[illegible]	[illegible]	[illegible]	[illegible]	5
AVENIR - Reassessment at Settlement	[illegible]	[illegible]	8	[illegible]	[illegible]	[illegible]	[illegible]	8
Bounded Structure Registration Questionn	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	1
Bounded Structure Update Questionnaire (	[illegible]	2	6	[illegible]	[illegible]	[illegible]	[illegible]	8
Call Centre Household Update Questionna	[illegible]	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	1
CENTRAL STATISTICS AGENCY ETHIOP	[illegible]	1	[illegible]	[illegible]	[illegible]	[illegible]	1	2

STATIC TEXT

[Questionnaire designer](https://designer.mysurvey.solutions/)



TITLE	[illegible]	[illegible]	[illegible]	
Public example User questions and common patterns	[illegible]	[illegible]	[illegible]	ACTION ▾
PUBLIC EXAMPLE Unicode Text and Formatting	[illegible]	[illegible]	[illegible]	ACTION ▾
Random selection of a nested roster	[illegible]	[illegible]	[illegible]	ACTION ▾
PUBLIC EXAMPLE Crop Harvest	[illegible]	[illegible]	[illegible]	ACTION ▾
Pick random HH in dwelling	[illegible]	[illegible]	empty	ACTION ▾
Public example Random Demo	[illegible]	[illegible]	[illegible]	ACTION ▾
PUBLIC EXAMPLE Food consumption example	[illegible]	[illegible]	[illegible]	ACTION ▾
Public example Randomizing order of questions	[illegible]	[illegible]	[illegible]	ACTION ▾
Question Types	[illegible]	[illegible]	[illegible]	ACTION ▾
Conditions	[illegible]	[illegible]	[illegible]	ACTION ▾
Public example Roster addressing	[illegible]	[illegible]	[illegible]	ACTION ▾
Public Example Crop sales	[illegible]	[illegible]	[illegible]	ACTION ▾
Public Example Linked roster demo	[illegible]	[illegible]	[illegible]	ACTION ▾

STATIC TEXT

[Most common expressions, functions, operators](https://docs.google.com/document/d/1cvuZ-RCJlFuNBG1oHVXDqzORP_IMpQ9ENNm1s5xSy1Y/edit?usp=sharing)

EXERCISES

STATIC TEXT

EXERCISE 4:

1. Create a new section in your questionnaire with “Agriculture” title.
2. Add following questions to the section.

Link to the [Exersize questionnaire] (https://docs.google.com/spreadsheets/d/1DalnykGBQwtJhRYsS0QQq6t7vs1WzkxfS4UMbWqPQr8/edit?usp=sharing) or use the link below to download the attachment in PDF format

3. Create a Reusable categories called “cropConditions” with categories from the questions above.
4. Replace Your categories on Reusable one in questions 2 and 6.
5. Compile your questionnaire and test the questionnaire with both Tester tools.

PDF

STATIC TEXT

EXERCISE 5:

1. Create a new section “Demographics, Land & Livestock”
2. Download the PDF version of the questionnaire
3. Implement the section. Skip all enabling conditions.

PDF

STATIC TEXT

EXERCISE 6:

1. Create a New section called “Plot roster”.
2. Download the file and create the questionnaire from the PDF questionnaire. Skip all conditions for now.
3. After you will finish, compile the questionnaire.
4. Test the section with Web-tester.

PDF

STATIC TEXT

EXERCISE 8:

1. Create a new section with title “Soil sample”
2. Download the PDF questionnaire.
3. Create the questionnaire from PDF version.

4. Compile the questionnaire.
5. Test your questionnaire with both Tester tools

STATIC TEXT

[Assesment](https://krivtsov.mysurvey.solutions/WebInterview/QSJA6DEQ/Start)

APPENDIX A — VALIDATION CONDITIONS AND MESSAGES

[1] hh_q02: 2. RELATIONSHIP TO HEAD:
Validation Condition:

```
// Conditional expression:

 // Is this person the household head?
//hh_q02 == 1 ?
    // If household head, check that there is only one household head listed
    //(HHroster.Count(x=>x.hh_q02==1)==1)
// If not a household head, then do not do anything
//: true

// Relational operators
// Is this person the household head?
(
    hh_q02 == 1 &&
    // If household head, than there is only one household head listed
    (HHroster.Count(x=>x.hh_q02==1)==1)
) ||
// Or it's not a household head
(hh_q02!=1)
```

Validation Message: There must be only one person in the household designated as head.
Validation Condition:

```
// Has relationship to head been answered for all household members?
HHroster.All(x=>x.hh_q02!=null) ?

    //  If all information has been filled out, check for a head was listed
    !(HHroster.Count(x=>x.hh_q02==1)==0)

    // If all information has not been filled, do not do anything
: true
```

Validation Message: There is no household head in the household
Validation Condition:

```
// If head of household, check that no spouse has the same sex as the head
self == 2 ?
    HHroster.Count(x=>x.hh_q02==1 && x.hh_q01==hh_q01)==0 :
// If spouse of head, check that that no head has the same sex as the spouse
self == 1 ?
    HHroster.Count(x=>x.hh_q02==2 && x.hh_q01==hh_q01)==0 :
// If neither chef nor spouse, nothing to check
true
```

Validation Message: Unlikely answer. It's rare that the head of household and his/her spouse have the same sex.

[2] flq_03: 2. RELATIONSHIP TO HEAD:
Validation Condition:

```
// Conditional expression:

 // Is this person the household head?
//flq_03 == 1 ?
    // If household head, check that there is only one household head listed
    //(flq_roster.Count(x=>x.flq_03==1)==1)
// If not a household head, then do not do anything
//: true

// Relational operators
// Is this person the household head?
(
    flq_03 == 1 &&
    // If household head, than there is only one household head listed
    (flq_roster.Count(x=>x.flq_03==1)==1)
) ||
// Or it's not a household head
(flq_03!=1)
```

Validation Message: There must be only one person in the household designated as head.
Validation Condition:

```
// Has relationship to head been answered for all household members?
flq_roster.All(x=>x.flq_03!=null) ?

    //  If all information has been filled out, check for a head was listed
    !(flq_roster.Count(x=>x.flq_03==1)==0)

    // If all information has not been filled, do not do anything
: true
```

Validation Message: There is no household head in the household
Validation Condition:

```
// If head of household, check that no spouse has the same sex as the head
self == 2 ?
    flq_roster.Count(x=>x.flq_03==1
    && x.flq_02==flq_02)==0 :
```

```
// If spouse of head, check that that no head has the same sex as the spouse
self == 1 ?
    flq_roster.Count(x=>x.flq_03==2
    && x.flq_02==flq_02)==0 :
// If neither chef nor spouse, nothing to check
true
```

Validation Message: Unlikely answer. It's rare that the head of household and his/her spouse have the same sex.

APPENDIX B — CATEGORIES

[1] Fruit
Categories: 1:Apple, 2:Orange, 4:Peach, 5:Apricot, 6:Tangerine, 7:Papaya, 8:Plum, 9:Grapefruit

[2] mainCrop: What is the main crop on this plot?
Categories: 1010:BEANS/COWPEA, 1040:COCOYAM, 1050:COTTON, 1060:GROUND NUT/PEANUTS, 1070:GUINEA CORN/SORGHUM, 1080:MAIZE, 1090:MELON/EGUSI, 1100:MILLET/MAIWA, 1110:RICE, 1121:WHITE YAM, 1122:YELLOW YAM, 1123:WATER YAM, 1124:THREE LEAVE YAM, 2010:ACHA, 2020:BAMBARA NUT, 2040:BEENI-SEED/SESAME, 2050:CARROT, 2060:CUCUMBER, 2070:CABBAGE, 2071:LETTUCE, 2080:GARDEN EGG, 2090:GARLIC, 2100:GINGER, 2120:OKRO, 2130:ONION, 2141:SWEET/BELL PEPPER (TATASHE), 2142:SMALL PEPPER (RODO), 3030:CHILLI PEPPER (SHOMBO), 2150:PIGEON PEA, 2180:IRISH POTATO, 2181:SWEET POTATO, 2190:PUMPKIN, 2194:GREEN VEGETABLE, 2220:SOYA BEANS, 2230:SUGAR CANE, 2250:TOBACCO, 2260:TOMATO, 2280:WHEAT, 2290:ZOBO, 9998:OTHER, TEMPORARY CROP (SPECIFY), 1020:CASSAVA, 2030:BANANA, 2160:PINEAPPLE, 2170:PLANTAIN, 2240:TEA, 2270:WALNUT, 3010:APPLE, 3020:CASHEW, 3040:COCOA, 3050:COCONUT, 3060:COFFEE, 3080:GRAPE FRUIT, 3090:GUAVA, 3110:KOLANUT, 3120:LEMON, 3130:LIME, 3150:MANDARIN/TANGERINE, 3160:MANGO, 3170:ORANGE, 3180:OIL PALM TREE, 3190:AGBONO(ORO SEED), 3200:OIL BEAN, 3210:PAWPAW, 3220:PEAR, 3221:AVOCADO PEAR, 3230:RUBBER, 9999:OTHER, PERMANENT CROP (SPECIFY)

[3] cultivatedCrops: Please select all crops that you have cultivated.
Categories: 1010:BEANS/COWPEA, 1040:COCOYAM, 1050:COTTON, 1060:GROUND NUT/PEANUTS, 1070:GUINEA CORN/SORGHUM, 1080:MAIZE, 1090:MELON/EGUSI, 1100:MILLET/MAIWA, 1110:RICE, 1121:WHITE YAM, 1122:YELLOW YAM, 1123:WATER YAM, 1124:THREE LEAVE YAM, 2010:ACHA, 2020:BAMBARA NUT, 2040:BEENI-SEED/SESAME, 2050:CARROT, 2060:CUCUMBER, 2070:CABBAGE, 2071:LETTUCE, 2080:GARDEN EGG, 2090:GARLIC, 2100:GINGER, 2120:OKRO, 2130:ONION, 2141:SWEET/BELL PEPPER (TATASHE), 2142:SMALL PEPPER (RODO), 3030:CHILLI PEPPER (SHOMBO), 2150:PIGEON PEA, 2180:IRISH POTATO, 2181:SWEET POTATO, 2190:PUMPKIN, 2194:GREEN VEGETABLE, 2220:SOYA BEANS, 2230:SUGAR CANE, 2250:TOBACCO, 2260:TOMATO, 2280:WHEAT, 2290:ZOBO, 9998:OTHER, TEMPORARY CROP (SPECIFY), 1020:CASSAVA, 2030:BANANA, 2160:PINEAPPLE, 2170:PLANTAIN, 2240:TEA, 2270:WALNUT, 3010:APPLE, 3020:CASHEW, 3040:COCOA, 3050:COCONUT, 3060:COFFEE, 3080:GRAPE FRUIT, 3090:GUAVA, 3110:KOLANUT, 3120:LEMON, 3130:LIME, 3150:MANDARIN/TANGERINE, 3160:MANGO, 3170:ORANGE, 3180:OIL PALM TREE, 3190:AGBONO(ORO SEED), 3200:OIL BEAN, 3210:PAWPAW, 3220:PEAR, 3221:AVOCADO PEAR, 3230:RUBBER, 9999:OTHER, PERMANENT CROP (SPECIFY)

[4] twoMainCrops: Please select two main crops that grow.
Categories: 1010:BEANS/COWPEA, 1040:COCOYAM, 1050:COTTON, 1060:GROUND NUT/PEANUTS, 1070:GUINEA CORN/SORGHUM, 1080:MAIZE, 1090:MELON/EGUSI, 1100:MILLET/MAIWA, 1110:RICE, 1121:WHITE YAM, 1122:YELLOW YAM, 1123:WATER YAM, 1124:THREE LEAVE YAM, 2010:ACHA, 2020:BAMBARA NUT, 2040:BEENI-SEED/SESAME, 2050:CARROT, 2060:CUCUMBER, 2070:CABBAGE, 2071:LETTUCE, 2080:GARDEN EGG, 2090:GARLIC, 2100:GINGER, 2120:OKRO, 2130:ONION, 2141:SWEET/BELL PEPPER (TATASHE), 2142:SMALL PEPPER (RODO), 3030:CHILLI PEPPER (SHOMBO), 2150:PIGEON PEA, 2180:IRISH POTATO, 2181:SWEET POTATO, 2190:PUMPKIN, 2194:GREEN VEGETABLE, 2220:SOYA BEANS, 2230:SUGAR CANE, 2250:TOBACCO, 2260:TOMATO, 2280:WHEAT, 2290:ZOBO, 9998:OTHER, TEMPORARY CROP (SPECIFY), 1020:CASSAVA, 2030:BANANA, 2160:PINEAPPLE, 2170:PLANTAIN, 2240:TEA, 2270:WALNUT, 3010:APPLE, 3020:CASHEW, 3040:COCOA, 3050:COCONUT, 3060:COFFEE, 3080:GRAPE FRUIT, 3090:GUAVA, 3110:KOLANUT, 3120:LEMON, 3130:LIME, 3150:MANDARIN/TANGERINE, 3160:MANGO, 3170:ORANGE, 3180:OIL PALM TREE, 3190:AGBONO(ORO SEED), 3200:OIL BEAN, 3210:PAWPAW, 3220:PEAR, 3221:AVOCADO PEAR, 3230:RUBBER, 9999:OTHER, PERMANENT CROP (SPECIFY)

[5] NE08: What crops do you grow on this plot?
Categories: 1010:BEANS/COWPEA, 1040:COCOYAM, 1050:COTTON, 1060:GROUND NUT/PEANUTS, 1070:GUINEA CORN/SORGHUM, 1080:MAIZE, 1090:MELON/EGUSI, 1100:MILLET/MAIWA, 1110:RICE, 1121:WHITE YAM, 1122:YELLOW YAM, 1123:WATER YAM, 1124:THREE LEAVE YAM, 2010:ACHA, 2020:BAMBARA NUT, 2040:BEENI-SEED/SESAME, 2050:CARROT, 2060:CUCUMBER, 2070:CABBAGE, 2071:LETTUCE, 2080:GARDEN EGG, 2090:GARLIC, 2100:GINGER, 2120:OKRO, 2130:ONION, 2141:SWEET/BELL PEPPER (TATASHE), 2142:SMALL PEPPER (RODO), 3030:CHILLI PEPPER (SHOMBO), 2150:PIGEON PEA, 2180:IRISH POTATO, 2181:SWEET POTATO, 2190:PUMPKIN, 2194:GREEN VEGETABLE, 2220:SOYA BEANS, 2230:SUGAR CANE, 2250:TOBACCO, 2260:TOMATO, 2280:WHEAT, 2290:ZOBO, 9998:OTHER, TEMPORARY CROP (SPECIFY)

[6] hh_d05: 5. What was the illness or injury?
Categories: 1:FEVER, MALARIA, 2:DIARRHEA, 3:STOMACH ACHE, 4:VOMITING, 5:SORE THROAT, 6:UPPER RESPIRATORY (SINUSES), 7:LOWER RESPIRATORY(CHEST, LUNGS), 8:FLU, 9:ASTHMA, 10:HEADACHE, 11:FAINTING, 12:SKIN PROBLEM, 13:DENTAL PROBLEM, 14:EYE PROBLEM, 15:EAR/NOSE/THROAT, 16:BACKACHE, 17:HEART PROBLEM, 18:BLOOD PRESSURE, 19:PAIN WHEN PASSING URINE, 20:DIABETES, 21:MENTAL DISORDER, 22:TB, 23:SEXUALLY TRANSMITTED DISEASE, 24:BURN, 25:FRACTURE, 26:WOUND, 27:POISONING, 28:PREGNANCY, 29:UNSPECIFIED LONG-TERM ILLNESS, 30:OTHER (SPECIFY)

[7] county: County
Categories: 10:JUDEŢUL ALBA, 29:JUDEŢUL ARAD, 38:JUDEŢUL ARGEŞ, 47:JUDEŢUL BACÃU, 56:JUDEŢUL BIHOR, 65:JUDEŢUL BISTRIŢA-NÃSÃUD, 74:JUDEŢUL BOTOŞANI, 83:JUDEŢUL BRAŞOV, 92:JUDEŢUL BRÃILA, 109:JUDEŢUL BUZÃU, 118:JUDEŢUL CARAŞ-SEVERIN, 127:JUDEŢUL CLUJ, 136:JUDEŢUL CONSTANŢA, 145:JUDEŢUL COVASNA, 154:JUDEŢUL DÂMBOVIŢA, 163:JUDEŢUL DOLJ, 172:JUDEŢUL GALAŢI, 181:JUDEŢUL GORJ, 190:JUDEŢUL HARGHITA, 207:JUDEŢUL HUNEDOARA, 216:JUDEŢUL IALOMIŢA, 225:JUDEŢUL IAŞI, 234:JUDEŢUL ILFOV, 243:JUDEŢUL MARAMUREŞ, 252:JUDEŢUL MEHEDINŢI, 261:JUDEŢUL MUREŞ, 270:JUDEŢUL NEAMŢ, 289:JUDEŢUL OLT, 298:JUDEŢUL PRAHOVA, 305:JUDEŢUL SATU MARE, 314:JUDEŢUL SÃLAJ, 323:JUDEŢUL SIBIU, 332:JUDEŢUL SUCEAVA, 341:JUDEŢUL TELEORMAN, 350:JUDEŢUL TIMIŞ, 369:JUDEŢUL TULCEA, 378:JUDEŢUL VASLUI, 387:JUDEŢUL VÂLCEA, 396:JUDEŢUL VRANCEA, 403:MUNICIPIUL BUCUREŞTI, 519:JUDEŢUL CÃLÃRAŞI, 528:JUDEŢUL GIURGIU

[8] municipality: Municipality/ Commune/ Town
Categories: 1017:MUNICIPIUL ALBA IULIA, 1071:CIUGUD, 1151:ORAŞ ABRUD, 1213:MUNICIPIUL AIUD, 1348:MUNICIPIUL BLAJ, 1455:ORAŞ CÂMPENI, 1696:ORAŞ CUGIR, 1794:ORAŞ OCNA MUREŞ, 1874:MUNICIPIUL SEBEŞ, 1936:ORAŞ ZLATNA, 2130:ALBAC, 2309:ALMAŞU MARE, 2381:ARIEŞENI, 2577:AVRAM IANCU, 2915:ORAŞ BAIA DE ARIEŞ, 2988:BERGHIN, 3039:BISTRA, 3397:BLANDIANA, 3459:BUCIUM, 3761:CENADE, 3805:CERGÃU, 3841:CERU-BÃCÃINŢI, 3958:CETATEA DE BALTÃ, 4008:CIURULEASA, 4106:CÂLNIC, 4142:CRICÃU, 4188:CRÃCIUNELU DE JOS, 4240:DAIA ROMÂNÃ, 4268:DOŞTAT, 4302:FÃRÃU, 4366:GALDA DE JOS, 4482:GÂRBOVA, 4525:GÂRDA DE SUS, 4703:HOPÂRTA, 4767:HOREA, 4927:IGHIU, 4981:ÎNTREGALDE, 5103:JIDVEI, 5167:LIVEZILE, 5210:LOPADEA NOUÃ, 5309:LUNCA MUREŞULUI, 5336:LUPŞA

, 5577:METEŞ, 5700:MIHALŢ, 5755:MIRÃSLÃU, 5826:MOGOŞ, 6048:NOŞLAC, 6119:OCOLIŞ, 6164:OHABA, 6217:PIANU, 6271:POIANA VADULUI, 6397:PONOR, 6468:POŞAGA, 6547:RÃDEŞTI, 6592:RÂMETEA, 6627:RÂMEŢ, 6761:ROŞIA MONTANÃ, 6930:ROŞIA DE SECAŞ, 6976:SÃLCIUA, 7044:SÃLIŞTEA, 7099:SÃSCIORI, 7197:SCÃRIŞOARA, 7348:SÂNCEL, 7384:SÂNTIMBRU, 7446:SOHODOL, 7767:STREMŢ, 7810:ŞIBOT, 7865:ŞONA, 7945:ŞPRING, 8014:ŞUGAG, 8096:ORAŞ TEIUŞ, 8158:UNIREA, 8229:VADU MOŢILOR, 8354:VALEA LUNGÃ, 8425:VIDRA, 8826:VINŢU DE JOS, 9019:CUT, 9026:BUCERDEA GRÂNOASĂ, 9262:MUNICIPIUL ARAD, 9280:FÂNTÂNELE, 9333:LIVADA, 9360:ŞOFRONEA, 9397:VLADIMIRESCU, 9459:ORAŞ CHIŞINEU-CRIŞ, 9495:ORAŞ CURTICI, 9538:ORAŞ INEU, 9574:ORAŞ LIPOVA, 9627:ORAŞ NÃDLAC, 9654:ORAŞ PÂNCOTA, 9690:ORAŞ SEBIŞ, 9743:ALMAŞ, 9798:APATEU, 9832:ARCHIŞ, 9887:BATA, 9930:BELIU, 10006:BIRCHIŞ, 10051:BÂRSA, 10104: BÂRZAVA, 10195:BOCSIG, 10239:BRAZII, 10293:BUTENI, 10346:CÃRAND, 10373:CERMEI, 10417:CHISINDIA, 10453:CONOP, 10514:COVÃSINŢ, 10532:CRAIVA, 10649:DEZNA, 10701:DIECI, 10765:USUSĂU, 10827:FELNAC, 10872:GHIOROC, 10916:GRÃNICERI, 10943:GURAHONŢ, 11058:HÃLMAGIU, 11174:HÃLMÃGEL, 11236:HÃŞMAŞ, 11307:IGNEŞTI, 11352:IRATOŞU, 11398:MACEA, 11423:MIŞCA, 11478:MONEASA, 11502:OLARI, 11539:PÃULIŞ, 11584:ORAŞ PECICA, 11637:PEREGU MARE, 11664:PETRIŞ, 11735:PILU, 11762:PLEŞCUŢA, 11842:SÃVÂRŞIN, 11940:SECUSIGIU, 11995:SELEUŞ, 12037:SEMLAC, 12055:SINTEA MARE, 12091:ORAŞ SÂNTANA, 12126:SOCODOR, 12144:ŞAGU, 12206:ŞEITIN, 12224:ŞEPREUŞ, 12242:ŞICULA, 12288:ŞILINDIA, 12340:ŞIMAND, 12368:ŞIRIA, 12402:ŞIŞTAROVÃŢ, 12457:TAUŢ, 12509:TÂRNOVA, 12572:VÃRÃDIA DE MUREŞ, 12643:VINGA, 12689:VÂRFURILE, 12778:ZÃBRANI, 12812:ZÃRAND, 12849:ZERIND, 12876:ZIMANDU NOU, 12912:DOROBANŢI, 12920:FRUMUŞENI, 12938:ZÃDÃRENI, 13169:MUNICIPIUL PITEŞTI, 13187:BASCOV, 13276:BRADU, 13301:ORAŞ MIOVENI, 13365:MÃRÃCINENI, 13392:ORAŞ ŞTEFÃNEŞTI, 13490:MUNICIPIUL CÂMPULUNG, 13524:VALEA MARE PRAVÃŢ, 13622:MUNICIPIUL CURTEA DE ARGEŞ, 13668:ORAŞ COSTEŞTI, 13757:ORAŞ TOPOLOVENI, 13819:ALBEŞTII DE ARGEŞ, 13891:ALBEŞTII DE MUSCEL, 13935:ALBOTA, 13999:ANINOASA, 14049:AREFU, 14085:BÃBANA, 14165:BÃICULEŞTI, 14272:BÃLILEŞTI, 14352:BELEŢI-NEGREŞTI, 14405:BEREVOEŞTI, 14450:BÂRLA, 14584:BOGAŢI, 14673:BOTENI, 14726:BOŢEŞTI, 14753:BRÃDULEŢ, 14851:BUDEASA, 14922:BUGHEA DE JOS, 14940:BUZOEŞTI, 15064:CÃLDÃRARU, 15108:CÃLINEŞTI, 15233:CÃTEASCA, 15313:CEPARI, 15402:CETÃŢENI, 15448:CICÃNEŞTI, 15493:CIOFRÂNGENI, 15554:CIOMÃGEŞTI, 15652:COCU, 15741:CORBENI, 15830:CORBI, 15901:COŞEŞTI, 15983:COTMEANA, 16132:CUCA, 16285:DAVIDEŞTI, 16329:DÂMBOVICIOARA, 16365:DÂRMÃNEŞTI, 16427:DOBREŞTI, 16454:DOMNEŞTI, 16472:DRAGOSLAVELE, 16506:DRÃGANU, 16551:GODENI, 16613:HÂRSEŞTI, 16659:HÂRTIEŞTI, 16739:IZVORU, 16757:LEORDENI, 16908:LEREŞTI, 16944:LUNCA CORBULUI, 17049:MÃLURENI, 17101:MERIŞANI, 17209:MICEŞTI, 17254:MIHÃEŞTI, 17334:MIOARELE, 17398:MIROŞI, 17423:MORÃREŞTI, 17496:MOŞOAIA, 17575:MOZÃCENI, 17619:MUŞÃTEŞTI, 17726:NEGRAŞI, 17771:NUCŞOARA, 17824:OARJA, 17851:PIETROŞANI, 17913:POIENARII DE ARGEŞ, 17968:POIENARII DE MUSCEL, 18028:POIANA LACULUI, 18162:POPEŞTI, 18242:PRIBOIENI, 18331:RÃTEŞTI, 18411:RECEA, 18475:ROCIU, 18527:RUCÃR, 18554:SÃLÃTRUCU, 18581:SÃPATA, 18670:SCHITU GOLEŞTI, 18741:SLOBOZIA, 18778:STÂLPENI, 18858:STOENEŞTI, 18938:STOLNICI, 19007:SUSENI, 19114:ŞTEFAN CEL MARE, 19141:ŞUICI, 19212:TEIU, 19249:TIGVENI, 19338:ŢIŢEŞTI, 19392:UDA, 19560:UNGHENI, 19631: VALEA DANULUI, 19695:VALEA IAŞULUI, 19793:VEDEA, 19999:VLÃDEŞTI, 20048:RÂCA, 20055:VULTUREŞTI, 20063:BUGHEA DE SUS, 20297:MUNICIPIUL BACÃU, 20313:HEMEIUŞ, 20359:LETEA VECHE, 20411:MÃGURA, 20466:MÃRGINENI, 20563:MUNICIPIUL ONEŞTI, 20607:GURA VÃII, 20670:ŞTEFAN CEL MARE, 20778:ORAŞ BUHUŞI, 20821:ORAŞ COMÃNEŞTI, 20876:MUNICIPIUL MOINEŞTI, 20910:ORAŞ SLÃNIC-MOLDOVA, 20965:ORAŞ TÂRGU OCNA, 21007:AGÃŞ, 21098:ARDEOANI, 21123:ASÃU, 21196:BALCANI, 21249:BEREŞTI-BISTRIŢA, 21338:BEREŞTI-TAZLÃU, 21418:BERZUNŢI, 21454:BÂRSÃNEŞTI, 21506:BLÃGEŞTI, 21560:BOGDÃNEŞTI, 21597:BRUSTUROASA, 21668:BUHOCI, 21720:CAŞIN, 21757:CÃIUŢI, 21855:CLEJA, 21891:COLONEŞTI, 21971:CORBASCA, 22059:COŢOFÃNEŞTI, 22111:DÃMIENEŞTI, 22166:ORAŞ DÃRMÃNEŞTI, 22237:DEALU MORII, 22380:DOFTEANA, 22460:FARAOANI, 22488:FILIPENI, 22576:FILIPEŞTI, 22665:GÃICEANA, 22718:GHIMEŞ-FÃGET, 22781:GÂRLENI, 22834:GLÃVÃNEŞTI, 22898:HELEGIU, 22941:HORGEŞTI, 23047:HURUIEŞTI, 23127:IZVORU BERHECIULUI, 23207:LIPOVA, 23289:LIVEZI, 23350:LUIZI-CÃLUGÃRA, 23387:MÃGIREŞTI, 23449:MÃNÃSTIREA CAŞIN, 23494:MOTOŞENI, 23644:NEGRI, 23715:NICOLAE BÃLCESCU, 23797:OITUZ, 23868:ONCEŞTI, 23948:ORBENI, 23975:PALANCA, 24034:PARAVA, 24089:PARINCEA, 24187:PÂNCEŞTI, 24276:PÂRGÃREŞTI, 24338:PÂRJOL, 24427:PLOPANA, 24524:PODU TURCULUI, 24631:PODURI, 24711:RACOVA, 24766:RÃCÃCIUNI, 24837:RÃCHITOASA, 24999:ROŞIORI, 25068:SASCUT, 25148:SÃNDULENI, 25228:SÃUCEŞTI, 25291:SCORŢENI, 25362:SECUIENI, 25488:SOLONŢ, 25521:STÃNIŞEŞTI, 25629:STRUGARI, 25692:TAMAŞI, 25745:TÃTÃRÃŞTI, 25825:TÂRGU TROTUŞ, 25861:TRAIAN, 25932:UNGURENI, 26029: URECHEŞTI, 26083:VALEA SEACÃ, 26118:VULTURENI, 26289:ZEMEŞ, 26320:SÃRATA, 26338:BUCIUMI, 26346:GIOSENI, 26353:ODOBEŞTI, 26361:PRÃJEŞTI, 26379:ITEŞTI, 26564:MUNICIPIUL ORADEA, 26582:SÂNMARTIN, 26653:SÂNTANDREI, 26699:ORAŞ ALEŞD, 26742:AŞTILEU, 26804:MUNICIPIUL BEIUŞ, 26840:ORAŞ ŞTEI, 26877:MUNICIPIUL MARGHITA, 26920:ORAŞ NUCET, 26975:MUNICIPIUL SALONTA, 27007:ORAŞ VAŞCÃU, 27070:ABRAM, 27169:ABRÃMUŢ, 27212:AUŞEU, 27285:AVRAM IANCU, 27329:BALC, 27383:BATÃR, 27436:BIHARIA, 27506:BOIANU MARE, 27560:BOROD, 27631:BORŞ, 27686:BRATCA, 27757:BRUSTURI, 27846:BUDUREASA, 27908:BUDUSLÃU, 27935:BULZ, 27971:BUNTEŞTI, 28077:CÃBEŞTI, 28139:CÃPÂLNA, 28193:CÃRPINET, 28246:CEFA, 28335:CEICA, 28415:CETARIU, 28497:CHERECHIU, 28530:CHIŞLAZ, 28610:SÂNIOB, 28665:CIUMEGHIU, 28709:CÂMPANI, 28763:COCIUBA MARE, 28816:COPÃCEL, 28889:CRIŞTIORU DE JOS, 28941:CURÃŢELE, 29001:CURTUIŞENI, 29038:DERNA, 29092:DIOSIG, 29154:DOBREŞTI, 29243:DRÃGÃNEŞTI, 29341:DRÃGEŞTI, 29403:FINIŞ, 29467:GIRIŞU DE CRIŞ, 29519:HIDIŞELU DE SUS, 29573:HOLOD, 29662:HUSASÃU DE TINCA, 29724:INEU, 29760:LAZURI DE BEIUŞ, 29813:LÃZÃRENI, 29902:LUGAŞU DE JOS, 29948:LUNCA, 30014:MÃDÃRAS, 30069:MÃGEŞTI, 30149:NOJORID, 30229:OLCEA, 30274:OŞORHEI, 30336:PIETROASA, 30416:POCOLA, 30470:POMEZEU, 30568:POPEŞTI, 30648:RÃBÃGANI, 30719:REMETEA, 30773:RIENI, 30844:ROŞIA, 30871:SÃCÃDAT, 30915:ORAŞ SÃCUENI, 30988:SÃLACEA, 31011:SÃLARD, 31057:SÂMBÃTA, 31128:SÂRBI, 31208:SPINUŞ, 31262:SUPLACU DE BARCÃU, 31333:ŞIMIAN, 31379:ŞINTEU, 31422:ŞOIMI, 31510:ŞUNCUIUŞ, 31565:TARCEA, 31609:TÃRCAIA, 31654:TÃUTEU, 31716:TILEAGD, 31789:TINCA, 31841:TULCA, 31878:ŢEŢCHEA, 31921:UILEACU DE BEIUŞ, 31976:VADU CRIŞULUI, 32027:ORAŞ VALEA LUI MIHAI, 32045:VIIŞOARA, 32090:VÂRCIOROG, 32153:TÃMÃŞEU, 32161:PALEU, 32179:SÂNNICOLAU ROMÂN, 32187:ROŞIORI, 32195:GEPIU, 32201:TOBOLIU, 32394:MUNICIPIUL BISTRIŢA, 32483:ORAŞ BECLEAN, 32544:ORAŞ NÃSÃUD, 32599:ORAŞ SÂNGEORZ-BÃI, 32633:BISTRIŢA BÂRGÃULUI, 32660:BRANIŞTEA, 32704:BUDACU DE JOS, 32768:BUDEŞTI, 32811:CÃIANU MIC, 32884:CETATE, 32955:CICEU-GIURGEŞTI, 33015:CHIOCHIŞ, 33122:CHIUZA, 33177:COŞBUC, 33202:DUMITRA, 33248:FELDRU, 33275:GALAŢII BISTRIŢEI, 33337:ILVA MARE, 33364:ILVA MICA, 33382:JOSENII BÂRGÃULUI, 33435:LECHINŢA, 33514:LEŞU, 33541:LIVEZILE, 33603:LUNCA ILVEI, 33621:MAIERU, 33658:MATEI, 33729:MÃGURA ILVEI, 33765:MÃRIŞELU, 33845:MICEŞTII DE CÂMPIE, 33881:MILAŞ, 33952:MONOR, 33989:NIMIGEA, 34075:NUŞENI, 34155:PARVA, 34173:PETRU RAREŞ, 34235:PRUNDU BÂRGÃULUI, 34262:REBRA, 34280:REBRIŞOARA, 34333:RODNA, 34360:ROMULI, 34397:SALVA, 34422:SILIVAŞU DE CÂMPIE, 34477:SÂNMIHAIU DE CÂMPIE, 34547:SPERMEZEU, 34618:ŞANŢ, 34645:ŞIEU, 34690:ŞIEU-MÃGHERUŞ, 34770:ŞIEU-ODORHEI, 34850:ŞIEUŢ, 34903:ŞINTEREAG, 34985:TEACA, 35054:TELCIU, 35090:TIHA BÂRGÃULUI, 35152:TÂRLIŞUA, 35269:URIU, 35312:URMENIŞ, 35429:ZAGRA, 35731:MUNICIPIUL BOTOŞANI, 35759:CURTEŞTI, 35839:RÃCHIŢI, 35884:STÃUCENI, 35946:ORAŞ DARABANI, 36006:MUNICIPIUL DOROHOI, 36060:ORAŞ SÃVENI, 36131:ALBEŞTI, 36202:AVRÃMENI, 36300:BÃLUŞENI, 36373:BRÃEŞTI, 36426:BROSCÃUŢI, 36453:ORAŞ BUCECEA, 36499:CÃLÃRAŞI, 36532:CONCEŞTI, 36569:COPÃLÃU, 36649:CORDÃRENI, 36676:CORLÃTENI, 36756:CORNI, 36809:COŢUŞCA, 36907:CRISTEŞTI, 36952:CRISTINEŞTI, 37011:DERSCA, 37057:DÂNGENI, 37100:DOBÂRCENI, 37173:DRÃGUŞENI, 37217: DURNEŞTI, 37280:ORAŞ FLÃMÂNZI, 37324:FRUMUŞICA, 37397:GEORGE ENESCU, 37459:GORBÃNEŞTI, 37547:HAVÂRNA, 37618:HÃNEŞTI, 37672:HILIŞEU-HORIA, 37734:HLIPICENI, 37770:HUDEŞTI, 37823:IBÃNEŞTI, 37850:LEORDA, 37912:LUNCA, 37958:MANOLEASA, 38063:MIHAI EMINESCU, 38161:MIHÃILENI, 38241:MIHÃLÃŞENI, 38321:MILEANCA, 38376:MITOC, 38456:NICŞENI, 38492:PÃLTINIŞ, 38544:POMÂRLA, 38580:PRÃJENI, 38633:RÃDÃUŢI-PRUT, 38679:RÃUŞENI, 38731:RIPICENI, 38811:ROMA, 38848:ROMÂNEŞTI, 38893:SANTA MARE, 38982:SUHARÃU, 39051:SULIŢA, 39122:ŞENDRICENI, 39168:ORAŞ ŞTEFÃNEŞTI, 39220:ŞTIUBIENI, 39266:TODIRENI, 39328:TRUŞEŞTI, 39391: TUDORA, 39417:UNGURENI, 39532:UNŢENI, 39612:VÃCULEŞTI, 39658:VIIŞOARA, 39694:VÂRFU CÂMPULUI, 39738:VLÃDENI, 39792:VLÃSINEŞTI, 39836:VORNICENI, 39872:VORONA, 39942:LOZNA, 39959:DIMÃCHENI, 39967:CÂNDEŞTI, 39975:COŞULA, 39983:BLÂNDEŞTI, 40035:ADÃŞENI, 40198:MUNICIPIUL BRAŞOV, 40214:ORAŞ GHIMBAV, 40241:MUNICIPIUL CODLEA, 40278:MUNICIPIUL FÃGÃRAŞ, 40303:ORAŞ PREDEAL, 40367:ORAŞ RÂŞNOV, 40394:ORAŞ RUPEA, 40438:MUNICIPIUL SÃCELE, 40465:ORAŞ VICTORIA, 40492:ORAŞ ZÃRNEŞTI, 40526:A

PAŢA, 40544:BECLEAN, 40606:BOD, 40633:BRAN, 40688:BUDILA, 40704:BUNEŞTI, 40768:CAŢA, 40820:CINCU, 40857:COMANA, 40900:CRISTIAN, 40928:DUMBRÃVIŢA, 40955:FELDIOARA, 40991:FUNDATA, 41033:HÃLCHIU, 41088:HÃRMAN, 41113:HÂRSENI, 41177:HOGHIZ, 41248:HOMOROD, 41284:JIBERT, 41346:LISA, 41382:MÃIERUŞ, 41417:MÂNDRA, 41471:MOIECIU, 41541:ORMENIŞ, 41578:PÃRÃU, 41621:POIANA MÃRULUI, 41667:PREJMER, 41701:RACOŞ, 41738:RECEA, 41818:ŞERCAIA, 41854:ŞINCA, 41925:SÂNPETRU, 41943:ŞOARŞ, 42003:TÃRLUNGENI, 42058:TELIU, 42076:TICUŞU, 42101:UCEA, 42156:UNGRA, 42183:VAMA BUZÃULUI, 42236:VIŞTEA, 42307:VOILA, 42398:VULCAN, 42449:ŞINCA NOUÃ, 42456:CRIZBAV, 42464:SÂMBĂTA DE SUS, 42472:HOLBAV, 42480:DRÃGUŞ, 42498:AUGUSTIN, 42682:MUNICIPIUL BRÃILA, 42708:CHISCANI, 42753:ORAŞ FÃUREI, 42771:SURDILA-GRECI, 42824:BÃRÃGANUL, 42842:BERTEŞTII DE JOS, 42913:BORDEI VERDE, 42968:CIOCILE, 43019:CIREŞU, 43073:DUDEŞTI, 43117:FRECÃŢEI, 43180:GALBENU, 43242:GEMENELE, 43279:GRADIŞTEA, 43313:GROPENI, 43331:ORAŞ IANCA, 43411:ORAŞ ÎNSURÃŢEI, 43466:JIRLÃU, 43493:MÃRAŞU, 43563:MÃXINENI, 43625:MIRCEA VODÃ, 43652:MOVILA MIRESII, 43698:RACOVIŢÃ, 43732:RÂMNICELU, 43787:ROMANU, 43812:ROŞIORI, 43867:SALCIA TUDOR, 43929:SCORŢARU NOU, 43992:SILIŞTEA, 44060:STÃNCUŢA, 44113:SURDILA-GÃISEANCA, 44140:ŞUŢEŞTI, 44177:TICHILEŞTI, 44202:TRAIAN, 44257:TUDOR VLADIMIRESCU, 44300:TUFEŞTI, 44328:ULMU, 44355:UNIREA, 44391:VÃDENI, 44435:VICTORIA, 44462:VIŞANI, 44505:VIZIRU, 44532:ZÃVOAIA, 44560:CAZASU, 44818:MUNICIPIUL BUZÃU, 44845:MUNICIPIUL RÂMNICU SÃRAT, 44863:AMARU, 44934:BALTA ALBÃ, 44989:BÃLÃCEANU, 45003:BECENI, 45101:BERCA, 45245:BISOCA, 45334:BLÃJANI, 45361:BOLDU, 45389:BOZIORU, 45496:BRÃDEANU, 45539:BRÃEŞTI, 45619:BREAZA, 45673:BUDA, 45753:CALVINI, 45815:C.A. 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149968:PREUTEŞTI, 150043:PUTNA, 150070:RÃDÃŞENI, 150114:RÂŞCA, 150178:SADOVA, 150196:SATU MARE, 150221:SIMINICEA, 150258:SLATINA, 150294:STRAJA, 150310:STROIEŞTI, 150356:STULPICANI, 150418:SUCEVIŢA, 150445:ŞARU DORNEI, 150524:TODIREŞTI, 150588:UDEŞTI, 150702:ULMA, 150766:VADU MOLDOVEI, 150891:VALEA MOLDOVEI, 150935:VAMA, 150980:VATRA MOLDOVIŢEI, 151022:VEREŞTI, 151077:VICOVU DE JOS, 151095:ORAŞ VICOVU DE SUS, 151120:VOLOVÃŢ, 151157:VULTUREŞTI, 151246:ZAMOSTEA, 151344:ZVORIŞTEA, 151433:COMÃNEŞTI, 151442:IASLOVÃŢ, 151451:CIOCÃNEŞTI, 151460:ŞERBÃUŢI, 151479:HORODNIC DE SUS, 151488:FÂNTÂNA MARE, 151497:COŞNA, 151503:CAPU CÂMPULUI, 151512:HÃNŢEŞTI, 151521:BURLA, 151530:BÃLÃCEANA, 151549:HÂRTOP, 151558:VOITINEL, 151567:CIPRIAN PORUMBESCU, 151576:BERCHIŞEŞTI, 151585:POIENI-SOLCA, 151683:MUNICIPIUL TURNU MĂGURELE, 151709:CIUPERCENI, 151736:ISLAZ, 151763:LIŢA, 151790:MUNICIPIUL ALEXANDRIA, 151816:NANOV, 151834:POROSCHIA, 151870:MUNICIPIUL ROŞIORI DE VEDE, 151905:ORAŞ VIDELE, 151932:CREVENICU, 151978:ORAŞ ZIMNICEA, 151996:BALACI, 152038:BÃBÃIŢA, 152083:BLEJEŞTI, 152127:BOGDANA, 152172:BOTOROAGA, 152234:BRAGADIRU, 152252:BRÂNCENI, 152270:BUJORENI, 152314:BUJORU, 152332:BUZESCU, 152350:CÃLINEŞTI, 152412:CÃLMÃŢUIU, 152467:CÃLMÃŢUIU DE SUS, 152500:CERVENIA, 152528:CIOLÃNEŞTI, 152564:CONŢEŞTI, 152582:COSMEŞTI, 152617:CRÂNGENI, 152662:CRÂNGU, 152724:DIDEŞTI, 152760:DOBROTEŞTI, 152797:DRÃCŞENEI, 152868:DRÃGÃNEŞTI DE VEDE, 152902:DRÃGÃNEŞTI-VLAŞCA, 152948:FURCULEŞTI, 152993:FRUMOASA, 153026:GÃLÃTENI, 153062:GRATIA, 153106:IZVOARELE, 153124:LISA, 153151:LUNCA, 153204:MAVRODIN, 153240:MÃGURA, 153277:MÃLDÃENI, 153295:MERENI, 153339:MÂRZÃNEŞTI, 153384:MOŞTENI, 153400:NÃSTURELU, 153437:NECŞEŞTI, 153473:OLTENI, 153507:ORBEASCA, 153543:PERETU, 153561:PIATRA, 153589:PIETROŞANI, 153605:PLOSCA, 153623:PLOPII-SLÃVITEŞTI, 153696:POENI, 153776:VITÃNEŞTI, 153829:PUTINEIU, 153865:RÃDOIEŞTI, 153909:RÃSMIREŞTI, 153936:SALCIA, 153972:SÃCENI, 154013:SCRIOAŞTEA, 154068:SCURTU MARE, 154139:SEACA, 154166:SFINŢEŞTI, 154184:SEGARCEA-VALE, 154228:SILIŞTEA, 154282:SILIŞTEA-GUMEŞTI, 154308:SÂRBENI, 154344:SLOBOZIA MÂNDRA, 154380:SMÂRDIOASA, 154415:STEJARU, 154460:SUHAIA, 154497:ŞTOROBÃNEASA, 154521:TALPA, 154585:TÃTÃRÃŞTII DE JOS, 154665:TÃTÃRÃŞTII DE S

US, 154709:TOPORU, 154736:TRAIAN, 154754:TRIVALEA-MOŞTENI, 154790:TROIANUL, 154834:ŢIGÃNEŞTI, 154852:VEDEA, 154914:VIIŞOARA, 154932:VÂRTOAPE, 154978:ZÂMBREASCA, 154996:NENCIULEŞTI, 155083:BECIU, 155092:BEUCA, 155109:DRACEA, 155118:FÂNTÂNELE, 155127:FRÃSINET, 155136:PURANI, 155145:SAELELE, 155154:UDA-CLOCOCIOV, 155243:MUNICIPIUL TIMIŞOARA, 155261:DUMBRÃVIŢA, 155289:GHIRODA, 155314:GIROC, 155350:MUNICIPIUL LUGOJ, 155403:ORAŞ BUZIAŞ, 155458:ORAŞ DETA, 155494:ORAŞ JIMBOLIA, 155528:ORAŞ SÂNNICOLAU MARE, 155546:BALINŢ, 155591:BANLOC, 155662:BARA, 155724:BEBA VECHE, 155760:BECICHERECU MIC, 155797:BELINŢ, 155840:BETHAUSEN, 155911:BILED, 155957:BÂRNA, 156035:BOGDA, 156106:BOLDUR, 156151:BRESTOVÃŢ, 156213:CÃRPINIŞ, 156259:CENAD, 156277:CENEI, 156311:CHEVEREŞU MARE, 156357:ORAŞ CIACOVA, 156437:COMLOŞU MARE, 156473:COŞTEIU, 156534:CRICIOVA, 156589:CURTEA, 156623:DAROVA, 156669:DENTA, 156712:DUDEŞTII VECHI, 156767:DUMBRAVA, 156801:ORAŞ FÃGET, 156927:FÂRDEA, 157004:FOENI, 157031:GAVOJDIA, 157086:ORAŞ GÃTAIA, 157193:GHIZELA, 157246:GIARMATA, 157273:GIERA, 157317:GIULVÃZ, 157362:JAMU MARE, 157424:JEBEL, 157451:LENAUHEIM, 157497:LIEBLING, 157530:LOVRIN, 157585:MARGINA, 157683:MAŞLOC, 157736:MÃNÃŞTIUR, 157781:MORAVIŢA, 157834:MOŞNIŢA NOUÃ, 157898:NÃDRAG, 157923:NIŢCHIDORF, 157969:OHABA LUNGÃ, 158010:ORŢIŞOARA, 158065:PECIU NOU, 158109:PERIAM, 158136:PIETROASA, 158181:PIŞCHIA, 158243:RACOVIŢA, 158314:ORAŞ RECAŞ, 158396:REMETEA MARE, 158449:SACOŞU TURCESC, 158528:SATCHINEZ, 158564:SÃCÃLAZ, 158608:SECAŞ, 158653:SÂNANDREI, 158699:SÂNMIHAIU ROMÂN, 158733:SÂNPETRU MARE, 158779:ŞAG, 158804:ŞTIUCA, 158859:TEREMIA MARE, 158895:TOMEŞTI, 158966:TOPOLOVÃŢU MARE, 159035:TORMAC, 159071:TRAIAN VUIA, 159142:UIVAR, 159213:VARIAŞ, 159259:VICTOR VLAD DELAMARINA, 159339:VOITEG, 159366:BIRDA, 159375:CHECEA, 159384:DUDEŞTII NOI, 159393:FIBIŞ, 159400:GHILAD, 159419:GOTTLOB, 159428:IECEA MARE, 159437:PARŢA, 159446:PÃDURENI, 159455:SARAVALE, 159464:ŞANDRA, 159473:TOMNATIC, 159482:VĂLCANI, 159491:LIVEZILE, 159507:PESAC, 159516:BUCOVĂŢ, 159525:OTELEC, 159614:MUNICIPIUL TULCEA, 159650:ORAŞ BABADAG, 159687:ORAŞ ISACCEA, 159730:ORAŞ MÃCIN, 159767:ORAŞ SULINA, 159785:BAIA, 159847:BEIDAUD, 159883:C.A. ROSETTI, 159945:CARCALIU, 159963:CASIMCEA, 160047:CEATALCHIOI, 160092:CEAMURLIA DE JOS, 160127:CERNA, 160172:CHILIA VECHE, 160225:CIUCUROVA, 160261:CRIŞAN, 160305:DÃENI, 160323:DOROBANŢU, 160387:FRECÃŢEI, 160430:GRECI, 160458:GRINDU, 160476:HAMCEARCA, 160528:HORIA, 160564:IZVOARELE, 160617:JIJILA, 160644:JURILOVCA, 160680:LUNCAVIŢA, 160724:MAHMUDIA, 160779:MALIUC, 160831:MIHAI BRAVU, 160877:MIHAIL KOGÃLNICEANU, 160911:MURIGHIOL, 160993:NALBANT, 161035:NICULIŢEL, 161053:NUFÃRU, 161106:OSTROV, 161133:PARDINA, 161151:PECENEAGA, 161179:SARICHIOI, 161231:SFÂNTU GHEORGHE, 161259:SLAVA CERCHEZÃ, 161286:SMÂRDAN, 161302:SOMOVA, 161348:STEJARU, 161384:TOPOLOG, 161464:TURCOAIA, 161482:VALEA NUCARILOR, 161525:I.C.BRÃTIANU, 161543:VÃCÃRENI, 161552:BEŞTEPE, 161561:VALEA TEILOR, 161794:MUNICIPIUL BÂRLAD, 161829:MUNICIPIUL HUŞI, 161856:ORAŞ NEGREŞTI, 161945:MUNICIPIUL VASLUI, 162014:ALBEŞTI, 162069:ALEXANDRU VLAHUŢÃ, 162149:ARSURA, 162194:BANCA, 162327:BÃCANI, 162381:BÃCEŞTI, 162452:BÃLTENI, 162498:BEREZENI, 162559:BLÃGEŞTI, 162595:BOGDANA, 162693:BOGDÃNEŞTI, 162791:BOGDÃNIŢA, 162871:BOŢEŞTI, 162924:BUNEŞTI-AVEREŞTI, 163002:CODÃEŞTI, 163057:COROIEŞTI, 163137:COSTEŞTI, 163208:CREŢEŞTI, 163253:DÃNEŞTI, 163324:DELENI, 163379:DELEŞTI, 163486:DRAGOMIREŞTI, 163618:DRÂNCENI, 163681:DUDA-EPURENI, 163734:DUMEŞTI, 163789:EPURENI, 163832:FÃLCIU, 163903:GÃGEŞTI, 163967:GHERGHEŞTI, 164062:GÂRCENI, 164133:GRIVIŢA, 164197:HOCENI, 164277:DIMITRIE CANTEMIR, 164339:IANA, 164393:IVÃNEŞTI, 164543:IVEŞTI, 164598:LAZA, 164687:LIPOVÃŢ, 164749:LUNCA BANULUI, 164829:MÃLUŞTENI, 164892:MICLEŞTI, 164936:MUNTENII DE JOS, 164981:ORAŞ MURGENI, 165069:OLTENEŞTI, 165130:OŞEŞTI, 165185:PÃDURENI, 165274:PERIENI, 165336:POIENEŞTI, 165416:POGANA, 165470:PUIEŞTI, 165611:PUNGEŞTI, 165719:REBRICEA, 165817:ROŞIEŞTI, 165899:SOLEŞTI, 165979:STÃNILEŞTI, 166057:ŞTEFAN CEL MARE, 166137:ŞULETEA, 166182:TANACU, 166235:TÃCUTA, 166315:TÃTÃRÃNI, 166413:TODIREŞTI, 166529:TUTOVA, 166636:VÃLENI, 166672:VETRIŞOAIA, 166707:VIIŞOARA, 166770:VINDEREI, 166869:VOINEŞTI, 166985:VULTUREŞTI, 167035:VUTCANI, 167071:ZÃPODENI, 167179:ZORLENI, 167222:IBÃNEŞTI, 167231:FRUNTIŞENI, 167240:RAFAILA, 167259:POGONEŞTI, 167268:CIOCANI, 167277:COZMEŞTI, 167286:DODEŞTI, 167295:FEREŞTI, 167302:MUNTENII DE SUS, 167311:POCHIDIA, 167320:PUŞCAŞI, 167473:MUNICIPIUL RÂMNICU VÂLCEA, 167641:ORAŞ BÃILE GOVORA, 167696:ORAŞ BÃILE OLÃNEŞTI, 167794:ORAŞ BREZOI, 167909:ORAŞ CÃLIMÃNEŞTI, 167981:MUNICIPIUL DRÃGÃŞANI, 168041:ORAŞ HOREZU, 168130:ORAŞ OCNELE MARI, 168229:ALUNU, 168309:AMÃRÃŞTI, 168372:ORAŞ BÃBENI, 168452:ORAŞ BÃLCEŞTI, 168559:BÃRBÃTEŞTI, 168602:ORAŞ BERBEŞTI, 168675:BERISLÃVEŞTI, 168755:BOIŞOARA, 168791:BUDEŞTI, 168880:BUJORENI, 168960:BUNEŞTI, 169039:CERNIŞOARA, 169119:CÂINENI, 169182:COPÃCENI, 169253:COSTEŞTI, 169306:CREŢENI, 169351:DÃEŞTI, 169404:DÃNICEI, 169547:DRÃGOEŞTI, 169583:FÃUREŞTI, 169681:FÂRTÃŢEŞTI, 169896:FRÂNCEŞTI, 169994:GALICEA, 170097:GHIOROIU, 170168:GLÃVILE, 170220:GOLEŞTI, 170346:GRÃDIŞTEA, 170444:GUŞOENI, 170514:IONEŞTI, 170612:LALOŞU, 170685:LÃDEŞTI, 170792:LÃPUŞATA, 170872:LIVEZI, 170952:LUNGEŞTI, 171021:MALAIA, 171067:MATEEŞTI, 171101:MÃCIUCA, 171209:MÃDULARI, 171272:MÃLDÃREŞTI, 171325:MIHÃEŞTI, 171469:MILCOIU, 171539:MUEREASCA, 171628:NICOLAE BÃLCESCU, 171806:OLANU, 171879:ORLEŞTI, 171931:OTEŞANI, 171995:PÃUŞEŞTI, 172082:PÃUŞEŞTI-MÃGLAŞI, 172153:PERIŞANI, 172279:PESCEANA, 172340:PIETRARI, 172377:POPEŞTI, 172457:PRUNDENI, 172509:RACOVIŢA, 172581:ROEŞTI, 172698:ROŞIILE, 172812:RUNCU, 172894:SÃLÃTRUCEL, 172947:SCUNDU, 172992:SINEŞTI, 173061:SLÃTIOARA, 173132:STÃNEŞTI, 173230:STOENEŞTI, 173374:STOILEŞTI, 173533:STROEŞTI, 173597:SUTEŞTI, 173686:ŞIRINEASA, 173748:ŞTEFÃNEŞTI, 173793:ŞUŞANI, 173855:TETOIU, 173935:TOMŞANI, 174021:VAIDEENI, 174085:VALEA MARE, 174156:VLÃDEŞTI, 174218:VOICEŞTI, 174254:VOINEASA, 174290:ZÃTRENI, 174496:TITEŞTI, 174502:DICULEŞTI, 174511:LÃCUSTENI, 174520:MITROFANI, 174744:MUNICIPIUL FOCŞANI, 174780:CÂMPINEANCA, 174824:GOLEŞTI, 174860:MUNICIPIUL ADJUD, 174922:ORAŞ MÃRÃŞEŞTI, 175019:ORAŞ ODOBEŞTI, 175055:ORAŞ PANCIU, 175126:ANDREIAŞU DE JOS, 175206:BÃLEŞTI, 175224:BÂRSEŞTI, 175260:BOGHEŞTI, 175368:BOLOTEŞTI, 175439:BORDEŞTI, 175466:BROŞTENI, 175509:CHIOJDENI, 175590:CIORÃŞTI, 175670:CÂMPURI, 175732:CÂRLIGELE, 175787:CORBIŢA, 175885:COTEŞTI, 175938:DUMBRÃVENI, 175983:DUMITREŞTI, 176150:FITIONEŞTI, 176212:GAROAFA, 176301:GUGEŞTI, 176338:GURA CALIŢEI, 176445:HOMOCEA, 176506:JARIŞTEA, 176551:JITIA, 176613:MÃICÃNEŞTI, 176686:MERA, 176748:MILCOVUL, 176793:MOVILIŢA, 176855:NÃNEŞTI, 176891:NÃRUJA, 176944:NEREJU, 177003:NISTOREŞTI, 177101:PALTIN, 177236:PÃUNEŞTI, 177263:POIANA CRISTEI, 177352:PUFEŞTI, 177405:RÃCOASA, 177469:REGHIU, 177557:RUGINEŞTI, 177600:SIHLEA, 177655:SLOBOZIA BRADULUI, 177726:SLOBOZIA CIORÃŞTI, 177762:SOVEJA, 177799:STRÃOANE, 177842:SURAIA, 177879:TÃNÃSOAIA, 177986:TÃTÃRANU, 178046:TÂMBOEŞTI, 178117:TULNICI, 178180:ŢIFEŞTI, 178279:URECHEŞTI, 178313:VALEA SÃRII, 178377:VIDRA, 178475:VINTILEASCA, 178545:VIZANTEA-LIVEZI, 178607:VÂNÃTORI, 178689:VÂRTEŞCOIU, 178750:VRÂNCIOAIA, 178821:VULTURU, 178885:NEGRILEŞTI, 178894:PLOSCUŢENI, 178901:POPEŞTI, 178910:PĂULEŞTI, 178929:BILIEŞTI, 178938:GOLOGANU, 178947:OBREJIŢA, 178956:RÃSTOACA, 178965:SPULBER, 179132:MUNICIPIUL BUCUREŞTI, 179221:ORAŞ BRAGADIRU, 179249:CHIAJNA, 179285:ORAŞ CHITILA, 179310:DOBROEŞTI, 179347:GLINA, 179383:JILAVA, 179409:ORAŞ MÃGURELE, 179463:MOGOŞOAIA, 179481:ORAŞ OTOPENI, 179515:ORAŞ PANTELIMON, 179533:ORAŞ POPEŞTI LEORDENI, 179551:ORAŞ VOLUNTARI, 179588:COPĂCENI, 179604:POIENILE IZEI, 179613:ŞIEU, 179622:GROŞII ŢIBLEŞULUI, 179631:TREZNEA, 179640:VULCANA-PANDELE, 179659:NEGRILEŞTI, 179677:CÃMIN, 179686:DUMITRIŢA, 179695:ŞIMIŞNA, 179702:TRAIAN, 179711:VLÃDENI, 179720:POIANA ILVEI, 179739:MALU, 179748:COSOBA, 179757:HERÃŞTI, 179766:ISVOARELE, 179775:SÃBÃRENI, 179784:BORÃNEŞTI, 179793:BUEŞTI, 179800:MAIA, 179819:OGRADA, 179828:ROŞIORI, 179837:COAŞ, 179846:COLTÃU, 179855:GÂRDANI, 179864:ONCEŞTI, 179873:AGRIŞ, 179882:CIUMEŞTI, 179891:RACIU, 179908:PIETRARI, 179917:RÂU ALB, 179926:RÃSCÃEŢI, 179935:PERŞINARI, 179944:RUNCU SALVEI, 179953:CICEU-MIHĂIEŞTI, 179962:GĂLBINAŞI, 179971:COLELIA, 179980:MĂRCULEŞTI, 179999:MOLDOVENI, 180000:PLATONEŞTI, 180019:SĂRĂŢENI, 180028:PORUMBEŞTI, 180037:BOGHIŞ, 180046:GURA IALOMIŢEI, 180055:CRIVĂŢ, 180064:BĂRBULEŞTI, 180091:RACŞA

[9] siruta: Component locality (village) (SIRUTA Code)
Categories: 1026:ALBA IULIA, 1035:BÃRÃBANŢ, 1044:MICEŞTI, 1053:OARDA, 1062:PÂCLIŞA, 1080:CIUGUD, 1099:DRÂMBAR, 1106:LIMBA, 1115:HÃPRIA, 1124:ŞEUŞA, 1133:TELEAC, 1160:ABRUD, 1179:ABRUD-SAT, 1188:GURA CORNEI, 1197:SOHARU, 1222:AIUD, 1231:AIUDUL DE SUS, 1240:GÂMBAŞ, 1259:MÃGINA, 1268:PÃGIDA, 1277:CIUMBRUD, 1286:GÂRBOVA DE JOS, 1295:GÂRBOVA DE SUS, 1302:GÂRBOVIŢA, 1311:SÂNCRAI, 1320:ŢIFRA, 1357:BLAJ, 1366:DELENI-OBÂRŞIE, 1375:FLITEŞTI, 1384:IZVOARELE, 1393:PETRISAT, 1400:TIUR, 1419:VEZ

A, 1428:MÃNÃRADE, 1437:SPÃTAC, 1464:CÂMPENI, 1473:BONCEŞTI, 1482:BORLEŞTI, 1491:BOTEŞTI, 1507:CERTEGE, 1516:COASTA VÂSCULUI, 1525:DÃNDUŢ, 1534:DEALU BISTRII, 1543:DEALU CAPSEI, 1552:DRIC, 1561:FAŢA ABRUDULUI, 1570:FLOREŞTI, 1589:FURDUIEŞTI, 1598:MIHOEŞTI, 1605:MOTORÃŞTI, 1614:PESTE VALEA BISTRII, 1623:PODURI, 1632:SORLIŢA, 1641:TOMUŞEŞTI, 1650:VALEA BISTRII, 1669:VALEA CASELOR, 1678:VÂRŞI, 1703:CUGIR, 1712:BOCŞITURA, 1721:BUCURU, 1730:CÃLENE, 1749:FEŢENI, 1758:GOAŞELE, 1767:MUGEŞTI, 1776:VINEREA, 1801:OCNA MUREŞ, 1810:UIOARA DE JOS, 1829:UIOARA DE SUS, 1838:CISTEIU DE MUREŞ, 1847:MICOŞLACA, 1856:RÃZBOIENI-CETATE, 1883:SEBEŞ, 1892:LANCRÃM, 1909:PETREŞTI, 1918:RÃHÃU, 1945:ZLATNA, 1954:BOTEŞTI, 1963:BUDENI, 1972:DEALU ROATEI, 1981:DOBROT, 1990:DUMBRAVA, 2005:FENEŞ, 2014:GALAŢI, 2023:IZVORU AMPOIULUI, 2032:PÃTRÂNGENI, 2041:PIRITA, 2050:PÂRÃU GRUIULUI, 2069:PODU LUI PAUL, 2078:RUNC, 2087:RUŞI, 2096:SUSENI, 2103:TRÂMPOIELE, 2112:VALEA MICÃ, 2121:VÂLTORI, 2149:ALBAC, 2158:BÃRÃŞTI, 2167:BUDÃIEŞTI, 2176:CIONEŞTI, 2185:COSTEŞTI, 2194:DEALU LÃMÃŞOI, 2201:DEVE, 2210:DUPÃ PLEŞE, 2229:FAŢA, 2238:PLEŞEŞTI, 2247:POTIONCI, 2256:ROGOZ, 2265:ROŞEŞTI, 2274:RUSEŞTI, 2283:SOHODOL, 2292:TAMBOREŞTI, 2318:ALMAŞU MARE, 2327:ALMAŞU DE MIJLOC, 2336:BRÃDET, 2345:CHEILE CIBULUI, 2354:CIB, 2363:GLOD, 2372:NÃDÃŞTIA, 2390:ARIEŞENI, 2407:AVRÃMEŞTI, 2416:BUBEŞTI, 2425:CASA DE PIATRÃ, 2434:COBLEŞ, 2443:DEALU BAJULUI, 2452:FAŢA CRISTESEI, 2461:FAŢA LÃPUŞULUI, 2470:GALBENA, 2489:HODOBANA, 2498:IZLAZ, 2504:PÃNTEŞTI, 2513:PÃTRÃHÃIŢEŞTI, 2522:POIENIŢA, 2531:RAVICEŞTI, 2540:STURU, 2559:ŞTEI-ARIEŞENI, 2568:VANVUCEŞTI, 2586:AVRAM IANCU, 2595:ACHIMEŢEŞTI, 2602:AVRÃMEŞTI, 2611:BÃDÃI, 2620:BOLDEŞTI, 2639:CÃLUGÃREŞTI, 2648:CÃSOAIA, 2657:CÂNDEŞTI, 2666:CÂRÃŞTI, 2675:CÂRŢULEŞTI, 2684:COCEŞTI, 2693:COCOŞEŞTI, 2700:COROIEŞTI, 2719:DEALU CRIŞULUI, 2728:DOLEŞTI, 2737:DUMÃCEŞTI, 2746:GOJEIEŞTI, 2755:HELEREŞTI, 2764:INCEŞTI, 2773:JOJEI, 2782:MÃRTEŞTI, 2791:ORGEŞTI, 2808:PÃTRUŢEŞTI, 2817:PLAI, 2826:PUŞELEŞTI, 2835:ŞOICEŞTI, 2844:ŞTERTEŞTI, 2853:TÂRSA, 2862:TÂRSA-PLAI, 2871:VALEA MACIULUI, 2880:VALEA UŢULUI, 2899:VERDEŞTI, 2906:VIDRIŞOARA, 2924:BAIA DE ARIEŞ, 2933:BRÃZEŞTI, 2942:CIOARA DE SUS, 2951:MUNCELU, 2960:SARTÃŞ, 2979:SIMULEŞTI, 2997:BERGHIN, 3002:GHIRBOM, 3011:HENIG, 3020:STRAJA, 3048:BISTRA, 3057:ARONEŞTI, 3066:BÃLEŞTI, 3075:BÃLEŞTI-CÃTUN, 3084:BÂRLEŞTI, 3093:CHELETENI, 3100:CIULDEŞTI, 3119:CREŢEŞTI, 3128:DEALU MUNTELUI, 3137:DÂMBURENI, 3146:DURÃŞTI, 3155:GÃNEŞTI, 3164:GÂRDE, 3173:HODIŞEŞTI, 3182:HUDRICEŞTI, 3191:LIPAIA, 3208:LUNCA LARGÃ, 3217:LUNCA MERILOR, 3226:MIHÃIEŞTI, 3235:NÃMAŞ, 3244:NOVÃCEŞTI, 3253:PERJEŞTI, 3262:POIANA, 3271:POIU, 3280:RÃTITIŞ, 3299:RUNCURI, 3306:SÃLÃGEŞTI, 3315:ŞTEFANCA, 3324:TOLÃCEŞTI, 3333:TOMNATEC, 3342:TRIŞOREŞTI, 3351:ŢÃRÃNEŞTI, 3360:VÂRŞI-RONTU, 3379:VÂRŞII MARI, 3388:VÂRŞII MICI, 3404:BLANDIANA, 3413:ACMARIU, 3422:IBRU, 3431:POIENI, 3440:RÃCÃTÃU, 3468:BUCIUM, 3477:ANGHELEŞTI, 3486:BISERICANI, 3495:BUCIUM-SAT, 3501:CERBU, 3510:CIUCULEŞTI, 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4231:PÂNCA, 4259:DAIA ROMÂNÃ, 4277:DOŞTAT, 4286:BOZ, 4295:DEALU DOŞTATULUI, 4311:FÃRÃU, 4320:HERIA, 4339:MEDVEŞ, 4348:SÂNBENEDIC, 4357:ŞILEA, 4375:GALDA DE JOS, 4384:BENIC, 4393:CETEA, 4400:GALDA DE SUS, 4419:LUPŞENI, 4428:MÃGURA, 4437:MESENTEA, 4446:OIEJDEA, 4455:POIANA GALDEI, 4464:RÃICANI, 4473:ZÃGRIŞ, 4491:GÂRBOVA, 4507:CÃRPINIŞ, 4516:RECIU, 4534:GÂRDA DE SUS, 4543:BIHARIA, 4552:DEALU FRUMOS, 4561:DEALU ORDÂNCUŞII, 4570:DOBREŞTI, 4589:GHEŢARI, 4598:GÂRDA SEACÃ, 4605:HANÃŞEŞTI, 4614:HUZÃREŞTI, 4623:IZVOARELE, 4632:MUNUNÃ, 4641:OCOALE, 4650:PLAI, 4669:PLIŞTI, 4678:SCOARŢA, 4687:SUCEŞTI, 4696:SNIDE, 4712:HOPÂRTA, 4721:SILIVAŞ, 4730:ŞPÃLNACA, 4749:TURDAŞ, 4758:VAMA SEACÃ, 4776:HOREA, 4785:BABA, 4794:BUTEŞTI, 4801:DÂRLEŞTI, 4810:FERICET, 4829:GIURGIUŢ, 4838:MÃNCEŞTI, 4847:MÃTIŞEŞTI, 4856:NICULEŞTI, 4865:PÃTRUŞEŞTI, 4874:PETREASA, 4883:PRELUCA, 4892:TEIU, 4909:TRIFEŞTI, 4918:ZÂNZEŞTI, 4936:IGHIU, 4945:BUCERDEA VÂNOASÃ, 4954:IGHIEL, 4963:ŞARD, 4972:ŢELNA, 4990:ÎNTREGALDE, 5005:DEALU 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9672:MÃDERAT, 9707:SEBIŞ, 9716:DONCENI, 9725:PRUNIŞOR, 9734:SÃLÃJENI, 9752:ALMAŞ, 9761:CIL, 9770:JOIA MARE, 9789:RÃDEŞTI, 9805:APATEU, 9814:BERECHIU, 9823:MOŢIORI, 9841:ARCHIŞ, 9850:BÂRZEŞTI, 9869:GROŞENI, 9878:NERMIŞ, 9896:BATA, 9903:BACÃU DE MIJLOC, 9912:BULCI, 9921:ŢELA, 9949:BELIU, 9958:BENEŞTI, 9967:BOCHIA, 9976:VASILE GOLDIŞ, 9985:SECACI, 9994:TÃGÃDÃU, 10015:BIRCHIŞ, 10024:CÃPÃLNAŞ, 10033:OSTROV, 10042:VIRISMORT, 10060:BÂRSA, 10079:ALDEŞTI, 10088:HODIŞ, 10097:VOIVODENI, 10113:BÂRZAVA, 10122:BÃTUŢA, 10131:CÃPRUŢA, 10140:DUMBRÃVIŢA, 10159:GROŞII NOI, 10168:LALAŞINŢ, 10177:MONOROŞTIA, 10186:SLATINA DE MUREŞ, 10202:BOCSIG, 10211:MÂNERÃU, 10220:RÃPSIG, 10248:BRAZII, 10257:BUCEAVA-ŞOIMUŞ, 10266:IACOBINI, 10275:MÃDRIGEŞTI, 10284:SECAŞ, 10300:BUTENI, 10319:BERINDIA, 10328:CUIED, 10337:PÃULIAN, 10355:CÃRAND, 10364:SELIŞTEA, 10382:CERMEI, 10391:AVRAM IANCU, 10408:ŞOMOŞCHEŞ, 10426:CHISINDIA, 10435:PÃIUŞENI, 10444:VÃSOAIA, 10462:CONOP, 10471:BELOTINŢ, 10480:CHELMAC, 10499:MILOVA, 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11281:COMÃNEŞTI, 11290:URVIŞU DE BELIU, 11316:IGNEŞTI, 11325:MINEAD, 11334:NÃDÃLBEŞTI, 11343:SUSANI, 11361:IRATOŞU, 11370:VARIAŞU MARE, 11389:VARIAŞU MIC, 11405:MACEA, 11414:SÂNMARTIN, 11432:MIŞCA, 11441:SATU NOU, 11450:VÂNÃTORI, 11469:ZERINDU MIC, 11487:MONEASA, 11496:RÃNUŞA, 11511:OLARI, 11520:SINTEA MICÃ, 11548:PÃULIŞ, 11557:BARAŢCA, 11566:CLADOVA, 11575:SÂMBÃTENI, 11593:PECICA, 11600:BODROGU VECHI, 11619:SEDERHAT, 11628:TURNU, 11646:PEREGU MARE, 11655:PEREGU MIC, 11673:PETRIŞ, 11682:CORBEŞTI, 11691:ILTEU, 11708:OBÂRŞIA, 11717:ROŞIA NOUÃ, 11726:SELIŞTE, 11744:PILU, 11753:VÃRŞAND, 11771:PLEŞCUŢA, 11780:ACIUŢA, 11799:BUDEŞTI, 11806:DUMBRAVA, 11815:GURA VÃII, 11824:ROSTOCI, 11833:TÃLAGIU, 11851:SÃVÂRŞIN, 11860:CÃPRIOARA, 11879:CUIAŞ, 11888:HÃLÃLIŞ, 11897:PÂRNEŞTI, 11904:TEMEŞEŞTI, 11913:TOC, 11922:TROAŞ, 11931:VALEA MARE, 11959:SECUSIGIU, 11968:MUNAR, 11977:SATU MARE, 11986:SÂNPETRU GERMAN, 12000:SELEUŞ, 12019:IERMATA, 12028:MORODA, 12046:SEMLAC, 12064:SINTEA MARE, 12073:ADEA, 12082:ŢIPAR, 12108:SÂNTANA, 12117:CAPORAL ALEXA, 12135:SOCODOR, 12153:ŞAGU, 12162:CRUCENI, 12171:FIRITEAZ, 12180:FISCUT, 12199:HUNEDOARA TIMIŞANÃ, 12215:ŞEITIN, 12233:ŞEPREUŞ, 12251:ŞICULA, 12260:CHERELUŞ, 12279:GURBA, 12297:ŞILINDIA, 12304:CAMNA, 12313:IERCOŞENI, 12322:LUGUZÃU, 12331:SATU MIC, 12359:ŞIMAND, 12377:ŞIRIA, 12386:GALŞA, 12395:MÂSCA, 12411:ŞIŞTAROVÃŢ, 12420:CUVEŞDIA, 12439:LABAŞINŢ, 12448:VARNIŢA, 12466:TAUŢ, 12475:MINIŞEL, 12484:MINIŞU DE SUS, 12493:NADÃŞ, 12518:TÂRNOVA, 12527:AGRIŞU MARE, 12536:ARÃNEAG, 12545:CHIER, 12554:DRAUŢ, 12563:DUD, 12581:VÃRÃDIA DE MUREŞ, 12590:BAIA, 12607:JULIŢA, 12616:LUPEŞTI, 12625:NICOLAE BÃLCESCU, 12634:STEJAR, 12652:VINGA, 12661:MAILAT, 12670:MÃNÃŞTUR, 12698:VÂRFURILE, 12705:AVRAM IANCU, 12714:GROŞI, 12723:LAZURI, 12732:MÃGULICEA, 12741:MERMEŞTI, 12750:POIANA, 12769:VIDRA, 12787:ZÃBRANI, 12796:CHESINŢ, 12803:NEUDORF, 12821:ZÃRAND, 12830:CINTEI, 12858:ZERIND, 12867:IERMATA NEAGRÃ, 12885:ZIMANDU NOU, 12894:ANDREI ŞAGUNA, 12901:ZIMANDCUZ, 13178:PITEŞTI, 13196:BASCOV, 13203:BRÃILENI, 13212:GLÂMBOCU, 13221:MICA, 13230:PRISLOPU MIC, 13249:SCHIAU, 13258:UIASCA, 13267:VALEA URSULUI, 13285:BRADU, 13294:GEAMÃNA, 13310:MIOVENI, 13329:CLUCEREASA, 13338:COLIBAŞI, 13347:FÃGETU, 13356:RACOVIŢA, 13374:MÃRÃCINENI, 13383:ARGEŞELU, 13409:ŞTEFÃNEŞTI, 13418:ENCULEŞTI, 13427:GOLEŞTI, 13436:IZVORANI, 13445:ŞTEFÃNEŞTII NOI, 13454:VALEA MARE-PODGORIA, 13463:VIIŞOARA, 13472:ZÃVOI, 13506:CÂMPULUNG, 13515:VALEA RUMÂNEŞTILOR, 13533:VALEA MARE PRAVÃŢ, 13542:BILCEŞTI, 13551:COLNIC, 13560:FÂNTÂNEA, 13579:GURA PRAVÃŢ, 13588:NÃMÃEŞTI, 13597:PIETROASA, 13604:ŞELARI, 13631:CURTEA DE ARGEŞ, 13640:NOAPTEŞ, 13677:COSTEŞTI, 13686:BROŞTENI, 13695:LÃCENI, 13702:PÂRVU ROŞU, 13711:PODU BROŞTENI, 13720:SMEI, 13739:STÂRCI, 13766:TOPOLOVENI, 13775:BOŢÂRCANI, 13784:CRINTEŞTI, 13793:GORÃNEŞTI, 13800:ŢIGÃNEŞTI, 13828:ALBEŞTII PAMÂNTENI, 13837:ALBEŞTII UNGURENI, 13846:BRÃTEŞTI, 13855:DOBLEA, 13864:DOBROTU, 13873:DUMIREŞTI, 13882:FLORIENI, 13908:BUGHEA DE SUS, 13917:ALBEŞTI, 13926:CÂNDEŞTI, 13944:ALBOTA, 13953:CERBU, 13962:FRÃTEŞTI, 13971:GURA VÃII, 13980:MAREŞ, 14003:ANINOASA, 14012:BROŞTENI, 14021:SLÃNIC, 14030:VALEA SILIŞTII, 14058:CÃPÃŢÂNENII PÃMÂNTENI, 14067:AREFU, 14076:CÃPÃŢÂNENII UNGURENI, 14094:BÃBANA, 14101:BÃJÃNEŞTI, 14110:CIOBÃNEŞTI, 14129:COTMENIŢA, 14138:GROŞI, 14147:LUPUENI, 14156:SLÃATIOARELE, 14174:BÃICULEŞTI, 14183:ALUNIŞU, 14192:ANGHINEŞTI, 14209:ARGEŞANI, 14218:MÃNICEŞTI, 14227:STEJARI, 14236:TUTANA, 14245:VALEA BRAZILOR, 14254:VALEA LUI ENACHE, 14263:ZIGONENI, 14281:BÃLILEŞTI, 14290:BÃJEŞTI, 14307:GOLEŞTI, 14316:POIENIŢA, 14325:PRIBOAIA, 14334:ULIŢA, 14343:VALEA MARE-BRATIA, 14361:ZGRIPCEŞTI, 14370:BELEŢI, 14389:LENŢEA, 14398:NEGREŞTI, 14414:BEREVOEŞTI, 14423:BRATIA, 14432:GÃMÃCEŞTI, 14441:OŢELU, 14469:BÂRLA, 14478:AFRIMEŞTI, 14487:BÃDEŞTI, 14496:BRABEŢI, 14502:CIOCEŞTI, 14511:MALU, 14520:MÂNDRA, 14539:MOZÃCENII-VALE, 14548:PODIŞORU, 14557:ŞELÃREASCA, 14566:URLUENI, 14575:ZUVELCAŢI, 14593:BOGAŢI, 14600:BÂRLOI, 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PÃMÂNTENI, 15331:CÃRPENIŞ, 15340:CEPARII UNGURENI, 15359:MORÃŞTI, 15368:ŞENDRULEŞTI, 15377:URLUIEŞTI, 15386:VALEA MÃGUREI, 15395:ZAMFIREŞTI, 15411:CETÃŢENI, 15420:LÃICÃI, 15439:VALEA CETÃŢUIA, 15457:CICÃNEŞTI, 15466:BÃRÃŞTI, 15475:MIOARELE, 15484:URECHEŞTI, 15509:CIOFRÂNGENI, 15518:BURLUŞI, 15527:LACURILE, 15536:PIATRA, 15545:SCHITU-MATEI, 15563:RÃDUŢEŞTI, 15572:BECULEŞTI, 15581:BRATIA, 15590:CIOMÃGEŞTI, 15607:CUNGREA, 15616:DOGARI, 15625:FEDELEŞOIU, 15634:GIUCLANI, 15643:PÃUNEŞTI, 15661:RÃCHIŢELE DE JOS, 15670:BÃRBÃTEŞTI, 15689:COCU, 15698:CRUCIŞOARA, 15705:FÃCÃLEŢEŞTI, 15714:GREABÃNU, 15723:POPEŞTI, 15732:RÃCHIŢELE DE SUS, 15750:CORBENI, 15769:BERINDEŞTI, 15778:BUCŞENEŞTI, 15787:OEŞTII PAMÂ

NTENI, 15796:OEŞTII UNGURENI, 15803:POIENARI, 15812:ROTUNDA, 15821:TURBUREA, 15849:CORBI, 15858:CORBŞORI, 15867:JGHEABURI, 15876:PODURI, 15885:POIENÃREI, 15894:STÃNEŞTI, 15910:COŞEŞTI, 15929:JUPÂNEŞTI, 15938:LÃPUŞANI, 15947:LEICEŞTI, 15956:PÃCIOIU, 15965:PETREŞTI, 15974:PRISEACA, 15992:COTMEANA, 16007:BASCOVELE, 16016:BUNEŞTI, 16025:COSTEŞTI, 16034:DEALU PÃDURII, 16043:DRÃGOLEŞTI, 16052:LINTEŞTI, 16061:NEGEŞTI, 16070:PIELEŞTI, 16089:SÃNDULEŞTI, 16098:SPIRIDONI, 16105:URSOAIA, 16114:VÂRLOVENI, 16123:ZAMFIREŞTI, 16141:CUCA, 16150:BÃLŢATA, 16169:BÃRBÃLANI, 16178:CÂRCEŞTI, 16187:COTU, 16196:CRIVÃŢU, 16203:LÃUNELE DE SUS, 16212:MÃCÃI, 16221:MÃNEŞTI, 16230:SINEŞTI, 16249:STÃNICEI, 16258:TEODOREŞTI, 16267:VALEA CUCII, 16276:VONIGEASA, 16294:DAVIDEŞTI, 16301:CONŢEŞTI, 16310:VOROVENI, 16338:DÂMBOVICIOARA, 16347:CIOCANU, 16356:PODU DÂMBOVIŢEI, 16374:DÂRMÃNEŞTI, 16383:NEGRENI, 16392:PISCANI, 16409:VALEA NANDRII, 16418:VALEA RIZII, 16436:DOBREŞTI, 16445:FUREŞTI, 16463:DOMNEŞTI, 16481:DRAGOSLAVELE, 16490:VALEA HOTARULUI, 16515:DRÃGANU-OLTENI, 16524:BÃCEŞTI, 16533:DUMBRÃVEŞTI, 16542:PRISLOPU MARE, 16560:GODENI, 16579:BORDEIENI, 16588:CAPU PISCULUI, 16597:COTEŞTI, 16604:MALU, 16622:HÂRSEŞTI, 16631:CIOBANI, 16640:MARTALOGI, 16668:HÂRTIEŞTI, 16677:BÂRZEŞTI, 16686:DEALU, 16695:HULUBA, 16702:LESPEZI, 16711:LUCIENI, 16720:VULTUREŞTI, 16748:IZVORU, 16766:LEORDENI, 16775:BALOTEASCA, 16784:BÃILA, 16793:BÂNŢÃU, 16800:BUDIŞTENI, 16819:CIOLCEŞTI, 16828:CIULNIŢA, 16837:CÂRCIUMÃREŞTI, 16846:COTU MALULUI, 16855:GLÂMBOCATA, 16864:GLÂMBOCATA-DEAL, 16873:GLODU, 16882:MOARA MOCANULUI, 16891:SCHITU SCOICEŞTI, 16917:LEREŞTI, 16926:POJORÂTA, 16935:VOINEŞTI, 16953:LUNCA CORBULUI, 16962:BUMBUENI, 16971:CATANE, 16980:CIEŞTI, 16999:LÃNGEŞTI, 17003:MÂRGHIA DE JOS, 17012:MÂRGHIA DE SUS, 17021:PÃDUREŢI, 17030:SILIŞTENI, 17058:MÃLURENI, 17067:BUNEŞTI, 17076:PÃULEASCA, 17085:TOPLIŢA, 17094:ZÃRNEŞTI, 17110:MERIŞANI, 17129:BORLEŞTI, 17138:BRÃTEASCA, 17147:CAPU PISCULUI, 17156:CRÂMPOTANI, 17165:DOBROGOSTEA, 17174:MALU VÂNÃT, 17183:VÃRZARU, 17192:VÂLCELELE, 17218:MICEŞTI, 17227:BRÂNZARI, 17236:PÃULEASCA, 17245:PURCÃRENI, 17263:MIHÃEŞTI, 17272:DRÃGHICI, 17281:FURNICOŞI, 17290:RUDENI, 17307:VALEA BRADULUI, 17316:VALEA POPII, 17325:VÃCAREA, 17343:MÃŢÃU, 17352:ALUNIŞ, 17361:CHILII, 17370:COCENEŞTI, 17389:SUSLÃNEŞTI, 17405:MIROŞI, 17414:SURDULEŞTI, 17432:MORÃREŞTI, 17441:DEDULEŞTI, 17450:DEALU OBEJDEANULUI, 17469:LUMINILE, 17478:MÃNCIOIU, 17487:SÃPUNARI, 17502:MOŞOAIA, 17511:BÃTRÂNI, 17520:CIOCÃNÃI, 17539:DEALU VIILOR, 17548:HINŢEŞTI, 17557:LÃZÃREŞTI, 17566:SMEURA, 17584:MOZÃCENI, 17593:BABAROAGA, 17600:ZIDURILE, 17628:VÂLSÃNEŞTI, 17637:BOLOVÃNEŞTI, 17646:COSTEŞTI-VÂSLAN, 17655:MUSÃŢEŞTI, 17664:PROSIA, 17673:ROBAIA, 17682:STROEŞTI, 17691:VALEA FAURULUI, 17708:VALEA LUI MAŞ, 17717:VALEA MUSCELULUI, 17735:NEGRAŞI, 17744:BÂRLOGU, 17753:BUTA, 17762:MOZACU, 17780:NUCŞOARA, 17799:GRUIU, 17806:SBOGHIŢEŞTI, 17815:SLATINA, 17833:OARJA, 17842:CEAUŞEŞTI, 17860:PIETROŞANI, 17879:BÃDEŞTI, 17888:GÃNEŞTI, 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18572:VÃLENI, 18590:MÂRŢEŞTI, 18607:BÃNÃREŞTI, 18616:DEALU BRADULUI, 18625:DRÃGHICEŞTI, 18634:GÃINUŞA, 18643:LIPIA, 18652:POPEŞTI, 18661:TURCEŞTI, 18689:SCHITU GOLEŞTI, 18698:BURNEŞTI, 18705:COSTIŢÃ, 18714:LÃZÃREŞTI, 18723:LOTURI, 18732:VALEA PECHII, 18750:SLOBOZIA, 18769:NIGRIŞOARA, 18787:STÂLPENI, 18796:DEALU FRUMOS, 18803:LIVEZENI, 18812:OGREZEA, 18821:OPREŞTI, 18830:PIŢIGAIA, 18849:RÃDEŞTI, 18867:STOENEŞTI, 18876:BÃDENI, 18885:COTENEŞTI, 18894:LUNCA GÂRTII, 18901:PIATRA, 18910:SLOBOZIA, 18929:VALEA BÃDENILOR, 18947:STOLNICI, 18956:COCHINEŞTI, 18965:COTMEANA, 18974:FÂLFANI, 18983:IZBÃŞEŞTI, 18992:VLÃŞCUŢA, 19016:SUSENI, 19025:BURDEŞTI, 19034:CERŞANI, 19043:CHIRIŢEŞTI, 19052:GÃLEŞEŞTI, 19061:ODÃENI, 19070:PÃDURENI, 19089:STRÂMBENI, 19098:STEFÃNEŞTI, 19105:ŢUŢULEŞTI, 19123:ŞTEFAN CEL MARE, 19132:GLAVACIOC, 19150:ŞUICI, 19169:IANCULEŞTI, 19178:PALTENU, 19187:PÃULENI, 19196:RUDENI, 19203:VALEA CALULUI, 19221:TEIU, 19230:LEŞILE, 19258:TIGVENI, 19267:BÃDISLAVA, 19276:BÃLILEŞTI, 19285:BÃLTENI, 19294:BÂRSEŞTII DE JOS, 19301:BÂRSEŞTII DE SUS, 19310:BLAJU, 19329:VLÃDEŞTI, 19347:ŢIŢEŞTI, 19356:BUCŞENEŞTI-LOTAŞI, 19365:CIŞMEA, 19374:VALEA MÃNÃSTIRII, 19383:VALEA STÂNII, 19409:UDA, 19418:BÃDULEŞTI, 19427:BÃRÃNEŞTI, 19436:BRANIŞTEA, 19445:CHIRIŢEŞTI, 19454:COTU, 19463:DEALU BISERICII, 19472:DEALU TOLCESII, 19481:DICONEŞTI, 19490:GORANI, 19506:GREABÃN, 19515:LUNGULEŞTI, 19524:MIERCANI, 19533:RÂJLEŢU-GOVORA, 19542:ROMANA, 19551:SÃLIŞTEA, 19579:UNGHENI, 19588:COLŢU, 19597:GÃUJANI, 19604:GOIA, 19613:HUMELE, 19622:SATU NOU, 19640:VALEA DANULUI, 19659:BÃNICEŞTI, 19668:BOLCULEŞTI, 19677:BOROBÃNEŞTI, 19686:VERNEŞTI, 19702:VALEA IAŞULUI, 19711:BÃDILA, 19720:BÃRBÃLÃTEŞTI, 19739:BOROVINEŞTI, 19748:CERBURENI, 19757:MUSTÃŢEŞTI, 19766:RUGINOASA, 19775:UNGURENI, 19784:VALEA ULEIULUI, 19800:VEDEA, 19819:BÃDICEA, 19828:BLEJANI, 19837:BUREŢEŞTI, 19846:CHIRIŢEŞTI, 19855:CHIŢANI, 19864:CIUREŞTI, 19873:DINCANI, 19882:FATA, 19891:FRÃTICI, 19908:IZVORU DE JOS, 19917:IZVORU DE SUS, 19926:LUNGANI, 19935:MOGOŞEŞTI, 19944:PRODANI, 19953:RÃŢOI, 19962:VAŢA, 19971:VEŢIŞOARA, 19980:VÂRŞEŞTI, 20000:VLÃDEŞTI, 20019:COTEASCA, 20028:DRÃGHESCU, 20037:PUTINA, 20304:BACÃU, 20322:HEMEIUŞ, 20331:FÂNTÂNELE, 20340:LILIECI, 20368:LETEA VECHE, 20377:HOLT, 20386:RADOMIREŞTI, 20395:RUŞI-CIUTEA, 20402:SIRETU, 20420:MÃGURA, 20439:CRIHAN, 20448:DEALU-MARE, 20457:SOHODOL, 20475:MÃRGINENI, 20484:BARAŢI, 20493:LUNCANI, 20509:PÃDURENI, 20518:PODIŞ, 20527:POIANA, 20536:TREBEŞ, 20545:VALEA BUDULUI, 20572:ONEŞTI, 20581:BORZEŞTI, 20590:SLOBOZIA, 20616:GURA VÃII, 20625:CAPÃTA, 20634:DUMBRAVA, 20643:MOTOCEŞTI, 20652:PÃLTINATA, 20661:TEMELIA, 20689:ŞTEFAN CEL MARE, 20698:BOGDANA, 20705:BUCIUMI, 20714:GUTINAŞ, 20723:NEGOIEŞTI, 20732:RÃCÃUŢI, 20741:RÃDEANA, 20750:VIIŞOARA, 20787:BUHUŞI, 20796:MARGINEA, 20803:RUNCU, 20830:COMÃNEŞTI, 20849:PODEI, 20858:VERMEŞTI, 20885:MOINEŞTI, 20894:GÃZÃRIE, 20929:SLÃNIC-MOLDOVA, 20938:CERDAC, 20947:CIREŞOAIA, 20974:TÂRGU OCNA, 20983:POIENI, 20992:VÂLCELE, 21016:AGÃŞ, 21025:BELEGHET, 21034:COŞNEA, 21043:COTUMBA, 21052:DIACONEŞTI, 21061:GOIOASA, 21070:PRELUCI, 21089:SULŢA, 21105:ARDEOANI, 21114:LEONTINEŞTI, 21132:ASÃU, 21141:APA ASÃU, 21150:CIOBÃNUŞ, 21169:LUNCA ASÃU, 21178:PÃLTINIŞ, 21187:STRAJA, 21203:BALCANI, 21212:FRUMOASA, 21221:LUDAŞI, 21230:SCHITU FRUMOASA, 21258:BEREŞTI-BISTRIŢA, 21267:BRAD, 21276:CIUMAŞI, 21285:CLIMEŞTI, 21294:DUMBRAVA, 21301:FÃGEŢEL, 21310:ITEŞTI, 21329:PÃDURENI, 21347:BEREŞTI-TAZLÃU, 21356:BOŞOTENI, 21365:ENÃCHEŞTI, 21374:PRISACA, 21383:ROMÂNEŞTI, 21392:TESCANI, 21409:TURLUIANU, 21427:BERZUNŢI, 21436:BUDA, 21445:DRAGOMIR, 21463:BÂRSÃNEŞTI, 21472:ALBELE, 21481:BRÃTEŞTI, 21490:CARACLÃU, 21515:BLÃGEŞTI, 21524:BUDA, 21533:POIANA NEGUSTORULUI, 21542:ŢÂRDENII MARI, 21551:VALEA LUI ION, 21579:BOGDÃNEŞTI, 21588:FILIPEŞTI, 21604:BRUSTUROASA, 21613:BURUIENIŞ, 21622:BURUIENIŞU DE SUS, 21631:CAMENCA, 21640:CUCHINIŞ, 21659:HÂNGÃNEŞTI, 21677:BUHOCI, 21686:BIJGHIR, 21695:BUHOCEL, 21702:COTENI, 21711:DOSPINEŞTI, 21739:CAŞIN, 21748:CURIŢA, 21766:CÃIUŢI, 21775:BLIDARI, 21784:BOIŞTEA, 21793:FLOREŞTI, 21800:HELTIU, 21819:MÃRCEŞTI, 21828:POPENI, 21837:PRALEA, 21846:VRÂNCENI, 21864:CLEJA, 21873:SOMUŞCA, 21882:VALEA MICÃ, 21908:COLONEŞTI, 21917:CÃLINI, 21926:POIANA, 21935:SATU NOU, 21944:SPRIA, 21953:VALEA MARE, 21962:ZÃPODIA, 21980:CORBASCA, 21999:BÃCIOIU, 22004:MARVILA, 22013:POGLEŢ, 22022:ROGOAZA, 22031:SCÃRIŞOARA, 22040:VÂLCELE, 22068:COŢOFÃNEŞTI, 22077:BÂLCA, 22086:BOIŞTEA DE JOS, 22095:BORŞANI, 22102:TÃMÃŞOAIA, 22120:DÃMIENEŞTI, 22139:CÃLUGÃRENI, 22148:DRÃGEŞTI, 22157:PÃDURENI, 22175:DÃRMÃNEŞTI, 22184:DÃRMÃNEASCA, 22193:LÃPOŞ, 22200:PÃGUBENI, 22219:PLOPU, 22228:SÃLÃTRUC, 22246:DEALU MORII, 22255:BANCA, 22264:BÃLÃNEŞTI, 22273:BLAGA, 22282:BOBOŞ, 22291:BODEASA, 22308:BOSTÃNEŞTI, 22317:CALAPODEŞTI, 22326:CÃUIA, 22335:DOROFEI, 22344:GHIONOAIA, 22353:GRÃDEŞTI, 22362:NEGULEŞTI, 22371:TÃVÃDÃREŞTI, 22399:DOFTEANA, 22406:BOGATA, 22415:CUCUIEŢI, 22424:HÃGHIAC, 22433:LARGA, 22442:SEACA, 22451:ŞTEFAN VODÃ, 22479:FARAOANI, 22497:FILIPENI, 22503:BÃLAIA, 22512:BRAD, 22521:FRUNTEŞTI, 22530:MÃRÃŞTI, 22549:PÃDURENI, 22558:SLOBOZIA, 22567:VALEA BOŢULUI, 22585:FILIPEŞTI, 22594:BOANŢA, 22601:CÂRLIGI, 22610:CORNEŞTI, 22629:COTU GROSULUI, 22638:GALBENI, 22647:HÂRLEŞTI, 22656:ONIŞCANI, 22674:GÃICEANA, 22683:ARINI, 22692:HUŢU, 2

2709:POPEŞTI, 22727:FÃGET, 22736:BOLOVÃNIŞ, 22745:FÃGETU DE SUS, 22754:GHIMEŞ, 22763:RÃCHITIŞ, 22772:TÃRHÃUŞI, 22790:GÂRLENII DE SUS, 22807:GÂRLENI, 22816:LESPEZI, 22825:ŞURINA, 22843:GLÃVÃNEŞTI, 22852:FRUMUŞELU, 22861:MUNCELU, 22870:PUTREDENI, 22889:RÃZEŞU, 22905:HELEGIU, 22914:BRÃTILA, 22923:DELENI, 22932:DRÃGUGEŞTI, 22950:HORGEŞTI, 22969:BAZGA, 22978:GALERI, 22987:MÃRÃSCU, 22996:RÃCÃTÃU-RÃZEŞI, 23001:RÃCÃTÃU DE JOS, 23010:RECEA, 23029:SOHODOR, 23038:VÃLENI, 23056:HURUIEŞTI, 23065:CÃPOTEŞTI, 23074:FLOREŞTI, 23083:FUNDOAIA, 23092:OCHENI, 23109:PERCHIU, 23118:PRÃDAIŞ, 23136:IZVORU BERHECIULUI, 23145:ANTOHEŞTI, 23154:BÃIMAC, 23163:FÃGHIENI, 23172:OBÂRŞIA, 23181:OŢELEŞTI, 23190:PÃDURENI, 23216:LIPOVA, 23225:MÂLOSU, 23234:SATU NOU, 23243:VALEA CASELOR, 23252:VALEA HOGEI, 23261:VALEA MÃRULUI, 23270:VALEA MOŞNEAGULUI, 23298:LIVEZI, 23305:BÃLÃNEASA, 23314:ORÃŞA, 23323:POIANA, 23332:PRAJOAIA, 23341:SCÃRIGA, 23369:LUIZI-CÃLUGÃRA, 23378:OSEBIŢI, 23396:MÃGIREŞTI, 23403:PRÃJEŞTI, 23412:STÃNEŞTI, 23421:ŞESURI, 23430:VALEA ARINILOR, 23458:MÃNÃSTIREA CAŞIN, 23467:LUPEŞTI, 23476:PÂRVULEŞTI, 23485:SCUTARU, 23500:MOTOŞENI, 23519:BÂCLEŞTI, 23528:CHETRENI, 23537:CHICEREA, 23546:COCIU, 23555:CORNÃŢELU, 23564:FÂNTÂNELE, 23573:FUNDÃTURA, 23582:GURA CRÃIEŞTI, 23591:POIANA, 23608:PRAJA, 23617:ROTÃRIA, 23626:ŞENDREŞTI, 23635:ŢEPOAIA, 23653:NEGRI, 23662:BRAD, 23671:CÃLINEŞTI, 23680:MÂGLA, 23699:POIANA, 23706:URSOAIA, 23724:NICOLAE BÃLCESCU, 23733:BÃLŢATA, 23742:BUCHILA, 23751:GALBENI, 23760:LÃRGUŢA, 23779:SÃRATA, 23788:VALEA SEACÃ, 23804:OITUZ, 23813:CÃLCÂI, 23822:FERESTRÃU-OITUZ, 23831:HÂRJA, 23840:MARGINEA, 23859:POIANA SÃRATÃ, 23877:ONCEŞTI, 23886:BÃRBOASA, 23895:DEALU PERJULUI, 23902:ONCEŞTII VECHI, 23911:SATU NOU, 23920:TARNIŢA, 23939:TAULA, 23957:ORBENI, 23966:SCURTA, 23984:PALANCA, 23993:CÃDÃREŞTI, 24007:CIUGHEŞ, 24016:PAJIŞTEA, 24025:POPOIU, 24043:PARAVA, 24052:DRÃGUŞANI, 24061:RÃDOAIA, 24070:TEIUŞ, 24098:PARINCEA, 24105:BARNA, 24114:MILEŞTII DE JOS, 24123:MILEŞTII DE SUS, 24132:NÃNEŞTI, 24141:NÃSTÃSENI, 24150:POIENI, 24169:SATU NOU, 24178:VLADNIC, 24196:PÂNCEŞTI, 24203:CHILIA BENEI, 24212:DIENEŢ, 24221:FULGERIŞ, 24230:FUNDU VÃII, 24249:MOTOC, 24258:PETREŞTI, 24267:SOCI, 24285:PÂRGÃREŞTI, 24294:BAHNA, 24301:NICOREŞTI, 24310:PÂRÂU BOGHII, 24329:SATU NOU, 24347:PÂRJOL, 24356:BÃHNÃŞENI, 24365:BÃRNEŞTI, 24374:BÃSÃŞTI, 24383:CÂMPENI, 24392:HÂINEALA, 24409:PUSTIANA, 24418:TÃRÂŢA, 24436:PLOPANA, 24445:BUDEŞTI, 24454:DORNENI, 24463:FUNDU TUTOVEI, 24472:IŢCANI, 24481:RUSENII RÃZEŞI, 24490:RUSENII DE SUS, 24506:STRÃMINOASA, 24515:ŢÂGÂRA, 24533:PODU TURCULUI, 24542:BÃLÃNEŞTI, 24551:CÃBEŞTI, 24560:FICHITEŞTI, 24579:GIURGIOANA, 24588:HANŢA, 24597:LEHANCEA, 24604:PLOPU, 24613:RÃCUŞANA, 24622:SÂRBI, 24640:PODURI, 24659:BUCŞEŞTI, 24668:CERNU, 24677:CORNET, 24686:NEGRENI, 24695:PROHOZEŞTI, 24702:VALEA ŞOŞII, 24720:RACOVA, 24739:GURA VÃII, 24748:HÃLMÃCIOAIA, 24757:ILIEŞI, 24775:RÃCÃCIUNI, 24784:CIUCANI, 24793:FUNDU RÃCÃCIUNI, 24800:GHEORGHE DOJA, 24819:GÂŞTENI, 24828:RÃSTOACA, 24846:RÃCHITOASA, 24855:BARCANA, 24864:BUCŞA, 24873:BUDA, 24882:BURDUSACI, 24891:DÃNÃILA, 24908:DUMBRAVA, 24917:FARCAŞA, 24926:FUNDÃTURA RÃCHITOASA, 24935:HÃGHIAC, 24944:MAGAZIA, 24953:MOVILIŢA, 24962:OPRIŞEŞTI, 24971:PUTINI, 24980:TOCHILEA, 25004:ROŞIORI, 25013:MISIHÃNEŞTI, 25022:NEGUŞENI, 25031:POIENI, 25040:VALEA MARE, 25059:VALEA MICÃ, 25077:SASCUT, 25086:BEREŞTI, 25095:CONŢEŞTI, 25102:PÃNCEŞTI, 25111:SASCUT-SAT, 25120:SCHINENI, 25139:VALEA NACULUI, 25157:SÃNDULENI, 25166:BÂRZULEŞTI, 25175:COMAN, 25184:MATEIEŞTI, 25193:STUFU, 25200:TISA, 25219:VERŞEŞTI, 25237:SÃUCEŞTI, 25246:BOGDAN VODÃ, 25255:COSTEI, 25264:SCHINENI, 25273:SIRETU, 25282:ŞERBEŞTI, 25308:SCORŢENI, 25317:BOGDÃNEŞTI, 25326:FLOREŞTI, 25335:GRIGORENI, 25344:STEJARU, 25353:ŞERPENI, 25371:SECUIENI, 25380:BÃLUŞA, 25399:BERBINCENI, 25406:CHITICENI, 25415:CIUTUREŞTI, 25424:FUNDENI, 25433:GLODIŞOARELE, 25442:ODOBEŞTI, 25451:TISA-SILVESTRI, 25460:VALEA FÂNAŢULUI, 25479:VÃLENI, 25497:SOLONŢ, 25503:CUCUIEŢI, 25512:SÃRATA, 25530:STÃNIŞEŞTI, 25549:BALOTEŞTI, 25558:BELCIUNEASA, 25567:BENEŞTI, 25576:CRÃIEŞTI, 25585:GORGHEŞTI, 25594:SLOBOZIA, 25601:SLOBOZIA NOUÃ, 25610:VÃLENI, 25638:STRUGARI, 25647:CETÃŢUIA, 25656:IAZ, 25665:NADIŞA, 25674:PETRICICA, 25683:RÃCHITIŞU, 25709:TAMAŞI, 25718:CHETRIŞ, 25727:FURNICARI, 25736:GIOSENI, 25754:TÃTÃRÃŞTI, 25763:CORNII DE JOS, 25772:CORNII DE SUS, 25781:DRÃGEŞTI, 25790:GHERDANA, 25807:GIURGENI, 25816:UNGURENI, 25834:TÂRGU TROTUŞ, 25843:TUTA, 25852:VIIŞOARA, 25870:TRAIAN, 25889:BOGDÃNEŞTI, 25898:HERTIOANA DE JOS, 25905:HERTIOANA-RÃZEŞI, 25914:PRÃJEŞTI, 25923:ZÃPODIA, 25941:UNGURENI, 25950:BÃRTÃŞEŞTI, 25969:BIBIREŞTI, 25978:BOTA, 25987:BOTEŞTI, 25996:GÂRLA ANEI, 26001:VIFORENI, 26010:ZLÃTARI, 26038:URECHEŞTI, 26047:CORNÃŢEL, 26056:LUNCA DOCHIEI, 26065:SATU NOU, 26074:SLOBOZIA, 26092:VALEA SEACÃ, 26109:CUCOVA, 26127:LICHITIŞENI, 26136:BOSIA, 26145:DÃDEŞTI, 26154:DORNENI, 26163:GHILÃVEŞTI, 26172:GODINEŞTII DE JOS, 26181:GODINEŞTII DE SUS, 26190:MEDELENI, 26207:NÃZÃRIOAIA, 26216:REPRIVÃŢ, 26225:TOMOZIA, 26234:ŢIGÃNEŞTI, 26243:VALEA LUPULUI, 26252:VALEA MERILOR, 26261:VALEA SALCIEI, 26270:VULTURENI, 26298:ZEMEŞ, 26305:BOLÃTÃU, 26312:HEMIENI, 26573:ORADEA, 26591:SÂNMARTIN, 26608:BETFIA, 26617:CIHEI, 26626:CORDÃU, 26635:HAIEU, 26644:RONTÃU, 26662:SÂNTANDREI, 26671:PALOTA, 26706:ALEŞD, 26715:PÃDUREA NEAGRÃ, 26724:PEŞTIŞ, 26733:TINÃUD, 26751:AŞTILEU, 26760:CÃLÃŢEA, 26779:CHISTAG, 26788:PEŞTERE, 26813:BEIUŞ, 26822:DELANI, 26859:ŞTEI, 26886:MARGHITA, 26895:CHEŢ, 26902:GHENETEA, 26939:NUCET, 26948:BÃIŢA, 26957:BÃIŢA-PLAI, 26984:SALONTA, 27016:VAŞCÃU, 27025:CÂMP, 27034:CÂMP-MOŢI, 27043:COLEŞTI, 27052:VÃRZARII DE JOS, 27061:VÃRZARII DE SUS, 27089:ABRAM, 27098:COHANI, 27105:DIJIR, 27114:ITEU, 27123:ITEU NOU, 27132:MARGINE, 27141:SATU BARBÃ, 27150:SUIUG, 27178:ABRÃMUŢ, 27187:CRESTUR, 27196:FÃNCICA, 27203:PETREU, 27221:AUŞEU, 27230:CACUCIU VECHI, 27249:CODRIŞORU, 27258:GHEGHIE, 27267:GROŞI, 27276:LUNCŞOARA, 27294:AVRAM IANCU, 27301:ANT, 27310:TÃMAŞDA, 27338:BALC, 27347:ALMAŞU MARE, 27356:ALMAŞU MIC, 27365:GHIDA, 27374:SÃLDÃBAGIU DE BARCÃU, 27392:BATÃR, 27409:ARPÃŞEL, 27418:TALPOŞ, 27427:TÃUT, 27445:BIHARIA, 27454:CAUACEU, 27463:NIUVED, 27472:PARHIDA, 27481:SATU NOU, 27490:TÃMÃŞEU, 27515:BOIANU MARE, 27524:CORBOAIA, 27533:HUTA, 27542:PÃGAIA, 27551:RUGEA, 27579:BOROD, 27588:BOROZEL, 27597:CETEA, 27604:CORNIŢEL, 27613:ŞERANI, 27622:VALEA MARE DE CRIŞ, 27640:BORŞ, 27659:SANTÃUL MARE, 27668:SANTÃUL MIC, 27677:SÂNTION, 27695:BRATCA, 27702:DAMIŞ, 27711:BEZNEA, 27720:LORÃU, 27739:PONOARÃ, 27748:VALEA CRIŞULUI, 27766:BRUSTURI, 27775:CUIEŞD, 27784:LORANTA, 27793:ORVIŞELE, 27800:PÃULEŞTI, 27819:PICLEU, 27828:ŢIGÃNEŞTII DE CRIŞ, 27837:VARASÃU, 27855:BUDUREASA, 27864:BURDA, 27873:SACA, 27882:SÃLIŞTE DE BEIUŞ, 27891:TELEAC, 27917:BUDUSLÃU, 27926:ALBIŞ, 27944:BULZ, 27953:MUNTENI, 27962:REMEŢI, 27980:BUNTEŞTI, 27999:BRÃDET, 28004:DUMBRÃVANI, 28013:FERICE, 28022:LELEŞTI, 28031:POIENII DE JOS, 28040:POIENII DE SUS, 28059:SÃUD, 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31994:BIRTIN, 32009:TOMNATIC, 32018:TOPA DE CRIŞ, 32036:VALEA LUI MIHAI, 32054:VIIŞOARA, 32063:IZVOARELE, 32072:PÃDURENI, 32081:REGHEA, 32107:VÂRCIOROG, 32116:FÂŞCA, 32125:SURDUCEL, 32134:ŞERGHIŞ, 32143:BÃILE FELIX, 32219:PĂCĂLEŞTI, 32401:BISTRIŢA, 32410:GHINDA, 32429:SÃRATA, 32438:SIGMIR, 32447:SLÃTINIŢA, 32456:UNIREA, 32465:VIIŞOARA, 32492:BECLEAN, 32508:COLDÃU, 32517:FIGA, 32526:RUSU DE JOS, 32553:NÃSÃUD, 32562:LIVIU REBREANU, 32571:LUŞCA, 32606:SÂNGEORZ-BÃI, 32615:CORMAIA, 32624:VALEA BORCUTULUI, 32642:BISTRIŢA BÂRGÃULUI, 32651:COLIBIŢA, 32679:BRANIŞTEA, 32688:CIREŞOAIA, 32697:MÃLUŢ, 32713:BUDACU DE JOS, 32722:BUDUŞ, 32731:JELNA, 32740:MONARIU, 32759:SIMIONEŞTI, 32777:BUDEŞTI, 32786:BUDEŞTI-FÂNAŢE, 32795:ŢAGU, 32802:ŢÃGŞORU, 32820:CÃIANU MIC, 32839:CÃIANU MARE, 32848:CICEU-POIENI, 32857:DOBRIC, 32866:DOBRICEL, 32875:DUMBRÃVIŢA, 32893:SATU NOU, 32900:BUDACU DE SUS, 32919:DUMITRIŢA, 32928:ORHEIU BISTRIŢEI, 32937:PETRIŞ, 32946:RAGLA, 32964:CICEU-GIURGEŞTI, 32973:BREAZA, 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36211:AVRÃMENI, 36220:ADÃŞENI, 36239:AUREL VLAICU, 36248:DIMITRIE CANTEMIR, 36257:ICHIMENI, 36266:PANAITOAIA, 36275:TIMUŞ, 36284:TUDOR VLADIMIRESCU, 36293:ZOIŢANI, 36319:BÃLUŞENI, 36328:BÃLUŞENII NOI, 36337:BUZENI, 36346:COŞULENI, 36355:DRAXINI, 36364:ZÃICEŞTI, 36382:BRÃEŞTI, 36391:POIANA, 36408:POPENI, 36417:VÂLCELELE, 36435:BROSCÃUŢI, 36444:SLOBOZIA, 36462:BUCECEA, 36471:BOHOGHINA, 36480:CÃLINEŞTI, 36505:CÃLÃRAŞI, 36514:LIBERTATEA, 36523:PLEŞANI, 36541:CONCEŞTI, 36550:MOVILENI, 36578:COPÃLÃU, 36587:BUDA, 36596:CERBU, 36603:COŞULA, 36612:COTU, 36621:PÃDURENI, 36630:ŞUPITCA, 36658:CORDÃRENI, 36667:GRIVIŢA, 36685:CORLÃTENI, 36694:CARASA, 36701:DIMÃCHENI, 36710:MATEIENI, 36729:PODENI, 36738:RECIA-VERBIA, 36747:VLÃDENI, 36765:CORNI, 36774:BALTA ARSÃ, 36783:MESTEACÃN, 36792:SARAFINEŞTI, 36818:COŢUŞCA, 36827:AVRAM IANCU, 36836:COTU MICULINŢI, 36845:CRASNALEUCA, 36854:GHIRENI, 36863:MIHAIL KOGÃLNICEANU, 36872:NICHITENI, 36881:NICOLAE BÃLCESCU, 36890:PUŢURENI, 36916:CRISTEŞTI, 36925:ONEAGA, 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VECHI, 42094：COBOR, 42110：UCEA DE JOS, 42129：CORBI, 42138：FELDIOARA, 42147：UCEA DE SUS, 42165：UNGRA, 42174：DÃIŞOARA, 42192：VAMA BUZÃULUI, 42209：ACRIŞ, 42218：BUZÃIEL, 42227：DÃLGHIU, 42245：VIŞTEA DE JOS, 42254：DRÃGUŞ, 42263：OLTEŢ, 42272：RUCÃR, 42281：VIŞTEA DE SUS, 42290：VIŞTIŞOARA, 42316：VOILA, 42325：CINCŞOR, 42334：DRIDIF, 42343：LUDIŞOR, 42352：SÂMBÃTA DE JOS, 42361：SÂMBÃTA DE SUS, 42370：STAŢIUNEA CLIMATERICÃ SÂMBÃTA, 42389：VOIVODENI, 42405：VULCAN, 42414：COLONIA 1 MAI, 42423：HOLBAV, 42432：POIANA BRAŞOV, 42691：BRÃILA, 42717：CHISCANI, 42726：LACU SÃRAT, 42735：VÃRSÃTURA, 42762：FÃUREI, 42780：SURDILA-GRECI, 42799：BRATEŞU VECHI, 42806：FÃUREI SAT, 42815：HORIA, 42833：BÃRÃGANUL, 42851：BERTEŞTII DE JOS, 42860：BERTEŞTII DE SUS, 42879：GURA CÃLMÃŢUI, 42888：GURA GÂRLUŢEI, 42897：NICOLEŞTI, 42904：SPIRU HARET, 42922：BORDEI VERDE, 42931：CONSTANTIN GABRIELESCU, 42940：FILIU, 42959：LIŞCOTEANCA, 42977：CIOCILE, 42986：CHIOIBAŞEŞTI, 42995：ODÃIENI, 43000：CHICHINEŢU, 43028：CIREŞU, 43037：BATOGU, 43046：IONEŞTI, 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47239:PESTRIŢU, 47248:PLAIU NUCULUI, 47257:PLOŞTINA, 47266:POTECU, 47275:SÃRENI, 47284:TERCA, 47293:VÂRTEJU, 47319:LUCIU, 47328:CARAGELE, 47346:MÃGURA, 47355:CIUTA, 47364:UNGURIU, 47382:MÃRÃCINENI, 47391:CÃPÃŢÂNEŞTI, 47408:POTOCENI, 47426:MÃRGÃRITEŞTI, 47435:CÂMPULUNGEANCA, 47444:FÂNTÂNELE, 47462:MEREI, 47471:CIOBÃNOAIA, 47480:DEALUL VIEI, 47499:DOBRILEŞTI, 47505:GURA SÃRÃŢII, 47514:IZVORU DULCE, 47523:LIPIA, 47532:NENCIULEŞTI, 47541:OGRÃZILE, 47550:SÃRATA-MONTEORU, 47569:VALEA PUŢULUI MEREI, 47587:MIHÃILEŞTI, 47596:COLŢÃNENI, 47603:FLORICA, 47612:MÃRGINEANU, 47621:SATU NOU, 47649:MÂNZÃLEŞTI, 47658:BEŞLII, 47667:BUŞTEA, 47676:CIREŞU, 47685:GHIZDITA, 47694:GURA BÃDICULUI, 47701:JGHIAB, 47710:PLAVÃŢU, 47729:POIANA VÂLCULUI, 47738:SATU VECHI, 47747:TRESTIOARA, 47756:VALEA COTOAREI, 47765:VALEA URSULUI, 47783:MOVILA BANULUI, 47792:CIORANCA, 47809:LIMPEZIŞ, 47827:MURGEŞTI, 47836:BATOGU, 47845:VALEA RATEI, 47863:NÃENI, 47872:FINŢEŞTI, 47881:FÂNTÂNELE, 47890:PROŞCA, 47907:VÂRF, 47925:NEHOIU, 47934:BÂSCA ROZILEI, 47943:CHIRLEŞTI, 47952:CURMÃTURA, 47961:LUNCA PRIPORULUI, 47970:MLÃJET, 47989:NEHOIAŞU, 47998:PÃLTINENI, 48003:STÃNILA, 48012:VINEŢIŞU, 48030:ODÃILE, 48049:CAPU SATULUI, 48058:CORNEANU, 48067:GORÂNI, 48076:LACU, 48085:PIATRA ALBÃ, 48094:POSOBEŞTI, 48101:SCOROŞEŞTI, 48110:VALEA FÂNTÂNEI, 48129:VALEA ŞTEFANULUI, 48147:PADINA, 48156:TÃTULEŞTI, 48174:PARDOŞI, 48183:CHIPERU, 48192:COSTOMIRU, 48209:VALEA LUI LALU, 48218:VALEA ŞCHIOPULUI, 48236:PÃNÃTÃU, 48245:BEGU, 48254:LACU CU ANINI, 48263:MÃGURICEA, 48272:PLÃIŞOR, 48281:RÂPILE, 48290:SIBICIU DE JOS, 48307:TEGA, 48316:ZAHAREŞTI, 48334:PÃTÂRLAGELE, 48343:CALEA CHIOJDULUI, 48352:CRÂNG, 48361:FUNDÃTURILE, 48370:GORNET, 48389:LUNCA, 48398:MÃRUNŢIŞU, 48405:MÃNÃSTIREA, 48414:MUŞCEL, 48423:POIENILE, 48432:SIBICIU DE SUS, 48441:STROEŞTI, 48450:VALEA LUPULUI, 48469:VALEA SIBICIULUI, 48478:VALEA VIEI, 48496:PIETROASELE, 48502:CÂLŢEŞTI, 48511:CLONDIRU DE SUS, 48520:DARA, 48539:PIETROASA MICÃ, 48548:ŞARÂNGA, 48566:PÂRSCOV, 48575:BADILA, 48584:CURCÃNEŞTI, 48593:LUNCA FRUMOASÃ, 48600:OLEŞEŞTI, 48619:PÂRJOLEŞTI, 48628:ROBEŞTI, 48637:RUNCU, 48646:TÂRCOV, 48655:TOCILENI, 48664:TRESTIENI, 48673:VALEA PURCARULUI, 48691:PODGORIA, 48708:COŢATCU, 48717:ORATIA, 48726:PLEŞEŞTI, 48735:TÃBÃCARI, 48753:POGOANELE, 48762:CÃLDÃRÃŞTI, 48780:POŞTA CÂLNÃU, 48799:ALICENI, 48806:COCONARI, 48815:POTÂRNICHEŞTI, 48824:SUDIŢI, 48833:ZILIŞTEANCA, 48851:PUIEŞTII DE JOS, 48860:DÃSCÃLEŞTI, 48879:LUNCA, 48888:MÃCRINA, 48897:NICOLEŞTI, 48904:PLOPI, 48913:PUIEŞTII DE SUS, 48931:RACOVIŢENI, 48940:BUDREA, 48959:PETRIŞORU, 48977:RÂMNICELU, 48986:COLIBAŞI, 48995:FOTIN, 49000:ŞTIUBEI, 49028:ROBEASCA, 49037:MOŞEŞTI, 49055:RUŞEŢU, 49064:SERGENT IONEL ŞTEFAN, 49082:SÃGEATA, 49091:BANIŢA, 49108:BEILIC, 49117:BORDUŞANI, 49126:DÂMBROCA, 49135:GÃVÃNEŞTI, 49144:MOVILIŢA, 49162:SÃHÃTENI, 49171:GÃGENI, 49180:ISTRIŢA DE JOS, 49199:VINTILEANCA, 49215:SÃPOCA, 49224:MÃTEŞTI, 49242:SÃRULEŞTI, 49251:CÃRÃTNÃU DE JOS, 49260:CÃRÃTNÃU DE SUS, 49279:GOICELU, 49288:SÃRILE-CÃTUN, 49297:VALEA LARGÃ-SÃRULEŞTI, 49304:VALEA STÂNEI, 49322:SCORŢOASA, 49331:BALTA TOCILA, 49340:BECIU, 49359:DELENI, 49368:DÂLMA, 49377:GOLU GRABICINA, 49386:GRABICINA DE JOS, 49395:GRABICINA DE SUS, 49402:GURA VÃII, 49411:PLOPEASA, 49420:POLICIORI, 49448:SCUTELNICI, 49457:ARCANU, 49466:BRÃGÃREASA, 49475:LIPÃNESCU, 49493:LUNCA JARIŞTEI, 49509:COLŢU PIETRII, 49518:CAŞOCA, 49527:GURA SIRIULUI, 49536:MUŞCELUŞA, 49554:SMEENI, 49563:ALBEŞTI, 49572:BÃLAIA, 49581:CÃLŢUNA, 49590:MOISICA, 49607:UDAŢI-LUCIENI, 49616:UDAŢI-MÂNZU, 49634:STÂLPU, 49652:IZVORU, 49661:BÃRBUNCEŞTI, 49670:GRÃJDANA, 49689:HALEŞ, 49698:IZVORANU, 49705:LEICULEŞTI, 49714:PÃDURENII, 49723:SALCIA, 49732:STREZENI, 49741:TISÃU, 49750:VALEA SÃLCIILOR, 49778:TOPLICENI, 49787:BÃBENI, 49796:CEAIRU, 49803:DEDULEŞTI, 49812:GURA FÃGETULUI, 49821:POŞTA, 49830:RÃDUCEŞTI, 49858:ŢINTEŞTI, 49867:MAXENU, 49876:ODAIA BANULUI, 49885:POGONELE, 49901:ULMENI, 49910:BÃLTÃREŢI, 49929:CLONDIRU, 49938:SÃRATA, 49947:VÂLCELE, 49965:VADU PAŞII, 49974:BÃJANI, 49983:FOCŞÃNEI, 49992:GURA CÂLNÃULUI, 50004:SCURTEŞTI, 50013:STÃNCEŞTI, 50031:VALEA RÂMNICULUI, 50040:OREAVUL, 50059:RUBLA, 50077:VALEA SALCIEI, 50086:MODRENI, 50095:VALEA SALCIEI-CÃTUN, 50111:VERNEŞTI, 50120:BRÃDEANCA, 50139:CÂNDEŞTI, 50148:CÂRLOMÃNEŞTI, 50157:MIEREA, 50166:NENCIU, 50175:NIŞCOV, 50184:SÃSENII NOI, 50193:SÃSENII PE VALE, 50200:SÃSENII VECHI, 50219:ZOREŞTI, 50237:VINTILÃ VODÃ, 50246:BODINEŞTI, 50255:COCA-ANTIMIREŞTI, 50264:COCA-NICULEŞTI, 50273:NICULEŞTI, 50282:PETRÃCHEŞTI, 50291:PODU MUNCII, 50308:SÂRBEŞTI, 50317:SMEEŞTI, 50335:VIPEREŞTI, 50344:MUSCEL, 50353:PÃLICI, 50362:RUŞAVÃŢ, 50371:TRONARI, 50380:URSOAIA, 50406:VÂLCELELE, 50424:FUNDENI, 50433:COMISOAIA, 50442:PRUNENI, 50451:VADU SOREŞTI, 50460:ZÃRNEŞTI, 50488:ZIDURI, 50497:COSTIENI, 50503:CUCULEASA, 50512:HELIADE RÃDULESCU, 50521:LANURILE, 50530:ZOIŢA, 50556:OJASCA, 50807:REŞIŢA, 50816:CÂLNIC, 50825:CUPTOARE, 50834:DOMAN, 50843:SECU, 50852:ŢEROVA, 50861:MONIOM, 50898:ANINA, 50905:STEIERDORF, 50932:BÃILE HERCULANE, 50941:PECINIŞCA, 50978:BOCŞA, 50996:OCNA DE FIER, 51029:CARANSEBEŞ, 51038:JUPA, 51065:MOLDOVA NOUÃ, 51074:MÃCEŞTI, 51083:MOLDOVA VECHE, 51092:MOLDOVIŢA, 51127:ORAVIŢA, 51136:CICLOVA MONTANÃ, 51145:MARILA, 51154:AGADICI, 51163:BRÃDIŞORU DE JOS, 51172:BROŞTENI, 51181:RÃCHITOVA, 51216:OŢELU ROŞU, 51225:CIREŞA, 51234:MAL, 51252:ARMENIŞ, 51261:FENEŞ, 51270:PLOPU, 51289:SAT BÃTRÂN, 51298:SUB MARGINE, 51314:BÃNIA, 51323:GÂRBOVÃŢ, 51341:BÃUŢAR, 51350:BUCOVA, 51369:CORNIŞORU, 51378:PREVECIORI, 51396:BERLIŞTE, 51403:IAM, 51412:MILCOVENI, 51421:RUSOVA NOUÃ, 51430:RUSOVA VECHE, 51458:BERZASCA, 51467:BIGÃR, 51476:COZLA, 51485:DRENCOVA, 51494:LIUBCOVA, 51519:BERZOVIA, 51528:FIZEŞ, 51537:GHERTENIŞ, 51555:BOLVAŞNIŢA, 51564:VÂRCIOROVA, 51582:BOZOVICI, 51591:PONEASCA, 51608:PRILIPEŢ, 51617:VALEA MINIŞULUI, 51635:BREBU, 51644:APADIA, 51653:VALEADENI, 51671:BREBU NOU, 51680:GÃRÂNA, 51706:BUCHIN, 51715:LINDENFELD, 51724:POIANA, 51733:PRISIAN, 51742:VALEA TIMIŞULUI, 51760:BUCOŞNIŢA, 51779:GOLEŢ, 51788:PETROŞNIŢA, 51797:VÃLIŞOARA, 51813:CARAŞOVA, 51822:IABALCEA, 51831:NERMED, 51859:CÃRBUNARI, 51868:ŞTINÃPARI, 51886:CÃVÃRAN, 51895:MACIOVA, 51902:MÂTNICU MARE, 51911:PEŞTERE, 51920:PRISACA, 51939:ZÃGUJENI, 51957:CICLOVA ROMÂNÃ, 51966:ILIDIA, 51

975:SOCOLARI, 51993:CIUCHICI, 52008:MACOVISTE, 52017:NICOLINŢ, 52026:PETRILOVA, 52044:CIUDANOVIŢA, 52053:JITIN, 52071:COP
ÃCELE, 52080:OHABA-MÂTNIC, 52099:RUGINOSU, 52106:ZORILE, 52124:CORNEA, 52133:CRUŞOVÃŢ, 52142:CUPTOARE, 52151:MACOVIŞ
TE, 52179:CORNEREVA, 52188:ARSURI, 52197:BOGÂLTIN, 52204:BOJIA, 52213:BORUGI, 52222:CAMENA, 52231:CIREŞEL, 52240:COSTIŞ, 5
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RA MICÃ, 52339:INELEŢ, 52348:IZVOR, 52357:LUNCA FLORII, 52366:LUNCA ZAICII, 52375:MESTEACÃN, 52384:NEGIUDIN, 52393:OBIŢA, 5
2400:POGARA DE SUS, 52419:POGARA, 52428:POIANA LUNGÃ, 52437:PRISACINA, 52446:PRISLOP, 52455:RUŞTIN, 52464:SCÃRIŞOARA, 52
473:STRUGASCA, 52482:STUDENA, 52491:SUB CRÂNG, 52507:SUB PLAI, 52516:TOPLA, 52525:ŢAŢU, 52534:ZÃNOGI, 52543:ZBEGU, 5255
2:ZMOGOTIN, 52561:ZOINA, 52589:DALBOŞEŢ, 52598:BÂRZ, 52605:BOINA, 52614:BOINIŢA, 52623:PRISLOP, 52632:REŞIŢA MICÃ, 52641:
ŞOPOTU VECHI, 52669:DOCLIN, 52678:BINIŞ, 52687:TIROL, 52703:DOGNECEA, 52712:CALINA, 52730:DOMAŞNEA, 52749:CÃNICEA, 5276
7:EZERIŞ, 52776:SOCENI, 52794:FÂRLIUG, 52801:DEZEŞTI, 52810:DULEU, 52829:REMETEA-POGÃNICI, 52838:SCÃIUŞ, 52847:VALEA MAR
E, 52865:FOROTIC, 52874:BREZON, 52883:COMORÂŞTE, 52892:SURDUCU MARE, 52918:GÂRNIC, 52927:PADINA MATEI, 52945:GLIMBOC
A, 52963:GORUIA, 52972:GIURGIOVA, 52981:GÂRLIŞTE, 53005:GRÃDINARI, 53014:GREONI, 53032:IABLANIŢA, 53041:GLOBU CRAIOVEI, 5
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:VERENDIN, 53176:LUPAC, 53185:CLOCOTICI, 53194:RAFNIC, 53201:VODNIC, 53229:MARGA, 53238:VAMA MARGA, 53256:MÃURENI, 532
65:ŞOŞDEA, 53283:MEHADIA, 53292:GLOBURÃU, 53309:PLUGOVA, 53318:VALEA BOLVAŞNIŢA, 53336:MEHADICA, 53354:NAIDÃŞ, 53363
:LESCOVIŢA, 53381:OBREJA, 53390:CIUTA, 53407:IAZ, 53416:VAR, 53434:PÃLTINIŞ, 53443:CORNUŢEL, 53452:DELINEŞTI, 53461:OHABIŢ
A, 53470:RUGI, 53498:CORONINI, 53504:SFÂNTA ELENA, 53522:POJEJENA, 53531:BELOBREŞCA, 53540:DIVICI, 53559:RADIMNA, 53568:Ş
UŞCA, 53586:PRIGOR, 53595:BORLOVENII NOI, 53602:BORLOVENII VECHI, 53611:PÃTAŞ, 53620:PUTNA, 53648:RAMNA, 53657:BÃRBOSU,
53666:VALEAPAI, 53684:RÃCÃŞDIA, 53693:VRÃNIUŢ, 53719:EFTIMIE MURGU, 53737:RUSCA MONTANÃ, 53746:RUŞCHIŢA, 53764:SACU, 5
3773:SÃLBÃGELU NOU, 53782:TINCOVA, 53808:SASCA MONTANÃ, 53817:BOGODINŢ, 53826:POTOC, 53835:SASCA ROMÂNÃ, 53844:SLA
TINA-NERA, 53862:SICHEVIŢA, 53871:BRESTELNIC, 53880:CAMENIŢA, 53899:CÂRŞIE, 53906:CRACU ALMÃJ, 53915:CRUŞOVIŢA, 53924:CU
RMÃTURA, 53933:FRÃSINIŞ, 53942:GORNEA, 53951:LIBORAJDEA, 53960:LUCACEVÃŢ, 53979:MARTINOVÃŢ, 53988:OGAŞU PODULUI, 53997
:STRENEAC, 54001:VALEA OREVIŢA, 54010:VALEA RAVENSCA, 54029:VALEA SICHEVIŢEI, 54038:ZÃNOU, 54047:ZÃSLOANE, 54065:SLATINA
-TIMIŞ, 54074:ILOVA, 54083:SADOVA NOUÃ, 54092:SADOVA VECHE, 54118:SOCOL, 54127:BAZIAŞ, 54136:CÂMPIA, 54145:PÂRNEAURA, 54
154:ZLATIŢA, 54172:ŞOPOTU NOU, 54181:CÂRŞA ROŞIE, 54190:DRIŞTIE, 54207:POIENILE BOINEI, 54216:RAVENSCA, 54225:RÃCHITA, 542
34:STÃNCILOVA, 54243:URCU, 54252:VALEA RÃCHITEI, 54261:VALEA ROŞIE, 54289:TEREGOVA, 54298:RUSCA, 54314:TICVANIU MARE, 54
323:CÂRNECEA, 54332:SECÃŞENI, 54341:TICVANIU MIC, 54369:TÂRNOVA, 54378:BRATOVA, 54396:TOPLEŢ, 54403:BÂRZA, 54421:TURNU
RUIENI, 54430:BORLOVA, 54449:CICLENI, 54458:DALCI, 54467:ZERVEŞTI, 54476:ZLAGNA, 54494:VÃLIUG, 54519:VÃRÃDIA, 54528:MERCIN
A, 54546:VERMEŞ, 54555:ERSIG, 54564:IZGAR, 54582:VRANI, 54591:CIORTEA, 54608:IERTOF, 54626:ZÃVOI, 54635:MÃGURA, 54644:MÃR
U, 54653:POIANA MÃRULUI, 54662:VALEA BISTREI, 54671:VOISLOVA, 54680:23 AUGUST, 54706:ZORLENŢU MARE, 54715:ZORLENCIOR, 54
984:CLUJ-NAPOCA, 55017:DEJ, 55026:OCNA DEJULUI, 55035:PEŞTERA, 55044:PINTIC, 55053:ŞOMCUTU MIC, 55071:CUZDRIOARA, 55080:
MÃNÃŞTUREL, 55099:VALEA GÂRBOULUI, 55115:JICHIŞU DE JOS, 55124:CODOR, 55133:JICHIŞU DE SUS, 55142:ŞIGÃU, 55151:TÃRPIU, 551
79:MICA, 55188:DÂMBU MARE, 55197:MÃNÃSTIREA, 55204:NIREŞ, 55213:SÂNMÃRGHITA, 55222:VALEA CIREŞOII, 55231:VALEA LUNCII, 5
5268:TURDA, 55286:MIHAI VITEAZU, 55295:CHEIA, 55302:CORNEŞTI, 55320:SÃNDULEŞTI, 55339:COPÃCENI, 55366:CÂMPIA TURZII, 5539
3:GHERLA, 55400:BÃIŢA, 55419:HÃŞDATE, 55428:SILIVAŞ, 55455:HUEDIN, 55464:BICÃLATU, 55482:AGHIREŞU, 55491:AGHIREŞU-FABRIC
I, 55507:ARGHIŞU, 55516:BÃGARA, 55525:DÂNCU, 55534:DOROLŢU, 55543:INUCU, 55552:LEGHIA, 55561:MACÃU, 55570:TICU, 55589:T
ICU-COLONIE, 55605:AITON, 55614:REDIU, 55632:ALUNIŞ, 55641:CORNENI, 55650:GHIROLT, 55669:PRUNENI, 55678:VALE, 55696:APAHI
DA, 55703:BODROG, 55712:CÂMPENEŞTI, 55721:CORPADEA, 55730:DEZMIR, 55749:PATA, 55758:SÂNNICOARÃ, 55767:SUB COASTÃ, 557
85:AŞCHILEU MARE, 55794:AŞCHILEU MIC, 55801:CRISTOREL, 55810:DORNA, 55829:FODORA, 55847:BACIU, 55856:CORUŞU, 55865:MER
A, 55874:POPEŞTI, 55883:RÃDAIA, 55892:SÃLIŞTEA NOUÃ, 55909:SUCEAGU, 55927:BÃIŞOARA, 55936:FRÃSINET, 55945:MOARA DE PÃDU
RE, 55954:MUNTELE BÃIŞORII, 55963:MUNTELE BOCULUI, 55972:MUNTELE CACOVEI, 55981:MUNTELE FILII, 55990:MUNTELE SÃCELULUI,
56005:SÃCEL, 56023:BELIŞ, 56032:BÃLCEŞTI, 56041:DEALU BOTII, 56050:GIURCUŢA DE JOS, 56069:GIURCUŢA DE SUS, 56078:POIANA H
OREA, 56087:SMIDA, 56103:BOBÂLNA, 56112:ANTÃŞ, 56121:BÃBDIU, 56130:BLIDÃREŞTI, 56149:CREMENEA, 56158:MAIA, 56167:OŞORH
EL, 56176:PRUNI, 56185:RÃZBUNENI, 56194:SUARÃŞ, 56201:VÂLCELELE, 56229:BONŢIDA, 56238:COASTA, 56247:RÃSCRUCI, 56256:TÃUŞ
ENI, 56274:BORŞA, 56283:BORŞA-CÃTUN, 56292:BORŞA-CRESTAIA, 56309:CIUMÃFAIA, 56318:GIULA, 56336:BUZA, 56345:ROTUNDA, 563
63:CÃIANU, 56372:BÃRÃI, 56381:CÃIANU MIC, 56390:CÃIANU-VAMÃ, 56407:VAIDA-CÃMÃRAŞ, 56416:VÃLENI, 56434:CÃLÃRAŞI, 56443:B
OGATA, 56452:CÃLÃRAŞI-GARÃ, 56470:CÃLÃŢELE, 56489:CÃLATA, 56498:DEALU NEGRU, 56504:FINCIU, 56513:VÃLENI, 56531:CÃMÃRAŞ
U, 56540:NÃOIU, 56559:SÂMBOLENI, 56577:CÃPUŞU MARE, 56586:AGÂRBICIU, 56595:BÃLCEŞTI, 56602:CÃPUŞU MIC, 56611:DÂNGÃU M
ARE, 56620:DÂNGÃU MIC, 56639:DUMBRAVA, 56648:PÃNICENI, 56657:STRAJA, 56675:CÃŞEIU, 56684:COMORÂŢA, 56693:COPLEAN, 5670
0:CUSTURA, 56719:GÂRBÃU DEJULUI, 56728:GUGA, 56737:LEURDA, 56746:RUGÃŞEŞTI, 56755:SÃLÃTRUC, 56764:URIŞOR, 56782:CÃTINA
, 56791:COPRU, 56808:FELDIOARA, 56817:HAGÃU, 56826:HODAIE, 56835:VALEA CALDÃ, 56853:CEANU MARE, 56862:ANDICI, 56871:BOI
AN, 56880:BOLDUŢ, 56899:CIURGÃU, 56906:DOSU NAPULUI, 56915:FÂNAŢE, 56924:HODÃI BOIAN, 56933:IACOBENI, 56942:MORŢEŞTI, 5
6951:STÂRCU, 56960:STRUCUT, 56979:VALEA LUI CATI, 56997:CHINTENI, 57001:DEUŞU, 57010:FEIURDENI, 57029:MÃCICAŞU, 57038:PÃ
DURENI, 57047:SATU LUNG, 57056:SÃLIŞTEA VECHE, 57065:SÂNMÃRTIN, 57074:VECHEA, 57092:CHIUIEŞTI, 57109:DOSU BRICII, 57118:H
UTA, 57127:MÃGOAJA, 57136:STRÂMBU, 57145:VALEA CÃŞEIELULUI, 57154:VALEA LUI OPRIŞ, 57172:CIUCEA, 57181:BUCEA, 57190:NEGR
ENI, 57207:PRELUCELE, 57216:VÂNÃTORI, 57234:CIURILA, 57243:FILEA DE JOS, 57252:FILEA DE SUS, 57261:PÃDURENI, 57270:PRUNIŞ, 57
289:SÃLICEA, 57298:SÃLIŞTE, 57305:ŞUTU, 57323:CÂŢCÃU, 57332:MUNCEL, 57341:SÃLIŞCA, 57369:COJOCNA, 57378:BOJ-CÃTUN, 57387
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VALEA BISERICII, 81736:VALEA MICÃ, 81745:VALEA POIENII, 81763:SÃCELU, 81772:BLAHNIŢA DE SUS, 81781:HÃIEŞTI, 81790:JERIŞTEA, 81807:MAGHEREŞTI, 81825:SÃULEŞTI, 81834:BIBEŞTI, 81843:DOLCEŞTI, 81852:PURCARU, 81870:SCOARŢA, 81889:BOBU, 81898:BUDIENI, 81905:CERÃTU DE COPÃCIOASA, 81914:CÂMPU MARE, 81923:COLIBAŞI, 81932:COPÃCIOASA, 81941:LAZURI, 81950:LINTEA, 81969:MOGOŞANI, 81978:PIŞTEŞTII DIN DEAL, 81996:SÂMBOTIN, 82001:ARSURI, 82010:GORNÃCEL, 82029:PÃJIŞTELE, 82038:SCHELA, 82056:SLIVILEŞTI, 82065:COJMÃNEŞTI, 82074:MICULEŞTI, 82083:ŞTIUCANI, 82092:STRÂMTU, 82109:SURA, 82118:ŞIACU, 82127:TEHOMIR, 82145:STÃNEŞTI, 82154:ALEXENI, 82163:BÃLANI, 82172:CÃLEŞTI, 82181:CURPEN, 82190:MÃZÃROI, 82207:OBREJA, 82216:PÂRVULEŞTI, 82225:VAIDEI, 82234:VÃLARI, 82252:STEJARI, 82261:BALOŞANI, 82270:BÃCEŞTI, 82289:DEALU LEULUI, 82298:PISCOIU, 82305:POPEŞTI STEJARI, 82323:STOINA, 82332:CIORARI, 82341:MIELUŞEI, 82350:PÃIŞANI, 82369:TOIAGA, 82378:ULMET, 82387:URDA DE SUS, 82403:TELEŞTI, 82412:BUDUHALA, 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CRIŞ, 91919:TÂRNAVA DE CRIŞ, 91928:VAŢA DE SUS, 91946:VÃLIŞOARA, 91955:DEALU MARE, 91964:SÃLIŞTIOARA, 91973:STOIENEASA, 91991:VEŢEL, 92006:BOIA BÂRZII, 92015:BRETELIN, 92024:CÃOI, 92033:HEREPEIA, 92042:LEŞNIC, 92051:MINTIA, 92060:MUNCELU MARE, 92079:MUNCELU MIC, 92088:RUNCU MIC, 92104:VORŢA, 92113:CERTEJU DE JOS, 92122:COAJA, 92131:DUMEŞTI, 92140:LUNCŞOARA, 92159:VALEA POIENII, 92168:VISCA, 92186:ZAM, 92195:ALMÃŞEL, 92202:ALMAŞ-SÃLIŞTE, 92211:BRÃŞEU, 92220:CERBIA, 92239:DELENI, 92248:GODINEŞTI, 92257:MICÃNEŞTI, 92266:POGÃNEŞTI, 92275:POJOGA, 92284:SÃLCIVA, 92293:TÃMÃŞEŞTI, 92300:VALEA, 92578:CÃLÃRAŞI, 92596:MODELU, 92612:RADU NEGRU, 92621:STOENEŞTI, 92630:TONEA, 92667:SLOBOZIA, 92676:BORA, 92685:SLOBOZIA NOUÃ, 92710:FETEŞTI, 92729:BULIGA, 92738:FETEŞTI-GARÃ, 92747:VLAŞCA, 92774:ŢÃNDÃREI, 92792:ALBEŞTI, 92809:BATALURI, 92818:BUEŞTI, 92827:MARSILIENI, 92845:AMARA, 92854:AMARA NOUÃ, 92881:ANDRÃŞEŞTI, 92890:ORBOEŞTI, 92916:BALACIU, 92925:COPUZU, 92934:CRÃSANII DE JOS, 92943:CRÃSANII DE 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31489:GÃVÃNEL, 131498:MÃLÃEŞTII DE JOS, 131504:MÃLÃEŞTII DE SUS, 131513:PLOPENI, 131522:SFÂRLEANCA, 131559:SINAIA, 131586:SLÃNIC, 131595:GROŞANI, 131602:PRÃJANI, 131639:URLAŢI, 131648:ARIONEŞTII NOI, 131657:ARIONEŞTII VECHI, 131666:CHERBA, 131675:JERCÃLÃI, 131684:MÃRUNŢIŞ, 131693:ORZOAIA DE JOS, 131700:ORZOAIA DE SUS, 131719:SCHIAU, 131728:ULMI, 131737:VALEA BOBULUI, 131746:VALEA CRÂNGULUI, 131755:VALEA MIEILOR, 131764:VALEA NUCETULUI, 131773:VALEA PIETREI, 131782:VALEA SEMAN, 131791:VALEA URLOII, 131826:VÃLENII DE MUNTE, 131844:GURA VITIOAREI, 131853:BUGHEA DE JOS, 131862:FÃGETU, 131871:FUNDENI, 131880:POIANA COPÃCENI, 131906:ADUNAŢI, 131915:OCINA DE JOS, 131924:OCINA DE SUS, 131942:ALBEŞTI-PALEOLOGU, 131951:ALBEŞTI-MURU, 131960:CIOCENI, 131979:VADU PÃRULUI, 131997:ALUNIŞ, 132002:OSTROVU, 132020:APOSTOLACHE, 132039:BUZOTA, 132048:MÂRLOGEA, 132057:UDREŞTI, 132066:VALEA CRICOVULUI, 132084:ARICEŞTII RAHTIVANI, 132093:BUDA, 132100:NEDELEA, 132119:STOENEŞTI, 132128:TÂRGŞORU NOU, 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DE SUS, 132832:VALEA OPRII, 132850:COSMINA DE JOS, 132869:COSMINA DE SUS, 132878:DRÃGHICEŞTI, 132887:POIANA TRESTIEI, 132903:DRAJNA DE SUS, 132912:CÃTUNU, 132921:CIOCRAC, 132930:DRAJNA DE JOS, 132949:FÃGET, 132958:OGRETIN, 132967:PIATRA, 132976:PIŢIGOI, 132985:PLAI, 132994:PODURILE, 133009:POIANA MIERLEI, 133027:DRÃGÃNEŞTI, 133036:BÃRÃITARU, 133045:BELCIUG, 133054:CORNU DE JOS, 133063:HÃTCÃRÃU, 133072:MERI, 133081:TUFANI, 133107:DUMBRAVA, 133116:CIUPELNIŢA, 133125:CORNU DE SUS, 133134:TRESTIENII DE JOS, 133143:TRESTIENII DE SUS, 133152:ZÃNOAGA, 133170:FILIPEŞTII DE PÃDURE, 133189:DIŢEŞTI, 133198:MINIERI, 133205:SILIŞTEA DEALULUI, 133223:FILIPEŞTII DE TÂRG, 133232:BRÃTÃŞANCA, 133241:EZENI, 133250:MÃRGINENII DE JOS, 133269:UNGURENI, 133287:FÂNTÂNELE, 133296:BOZIENI, 133303:GHINOAICA, 133312:UNGURENI, 133321:VADU SÃPAT, 133349:FLOREŞTI, 133358:CAP ROŞU, 133367:CÃLINEŞTI, 133376:CÃTINA, 133385:NOVÃCEŞTI, 133401:FULGA DE JOS, 133410:FULGA DE SUS, 133438:GHERGHIŢA, 133447:FÂNARI, 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134121:CHICIURENI, 134130:COSTENI, 134149:FÃCÃIENI, 134158:GHEABA, 134167:MÂNÃSTIREA SUZANA, 134176:MÃNECIU-PÃMÂNTENI, 134185:PLÃIEŢU, 134201:MÃNEŞTI, 134210:BÃLTIŢA, 134229:CHEŞNOIU, 134238:COADA IZVORULUI, 134247:COCORÃŞTII COLŢ, 134256:COCORÃŞTII GRIND, 134265:COLŢU DE JOS, 134274:GHIOLDUM, 134283:GURA CRIVÃŢULUI, 134292:PERŞUNARI, 134309:PIATRA, 134318:SATU DE SUS, 134327:ZALHANAUA, 134345:PÃCUREŢI, 134354:BÃRZILA, 134363:CURMÃTURA, 134372:MATIŢA, 134381:SLAVU, 134407:PLOPU, 134416:GÂLMEIA, 134425:HÂRSA, 134434:NISIPOASA, 134452:PODENII NOI, 134461:GHIOCEL, 134470:MEHEDINŢA, 134489:NEVESTEASCA, 134498:PODU LUI GALBEN, 134504:POPEŞTI, 134513:RAHOVA, 134522:SÃLCIOARA, 134531:SFÃCÃRU, 134540:VALEA DULCE, 134568:POIENARII BURCHII, 134577:CÃRBUNARI, 134586:OLOGENI, 134595:PIOREŞTI, 134602:PODU VÃLENI, 134611:POIENARII RALI, 134620:POIENARII VECHI, 134639:TÃTÃRÃI, 134657:POSEŞTII-PÃMÂNTENI, 134666:BODEŞTI, 134675:MERDEALA, 134684:NUCŞOARA DE SUS, 134693:NUCŞOARA DE JOS, 134700:POSEŞTII UNGURENI, 134719:TÂRLEŞTI, 134728:VALEA PLOPULUI, 134737:VALEA SCREZII, 134746:VALEA STUPINII, 134764:PREDEAL, 134773:BOBICEŞTI, 134782:POIENILE, 134791:SÃRARI, 134808:SÃRÃŢEL, 134817:TULBUREA, 134826:TULBUREA VÃLENI, 134835:VITIOARA DE SUS, 134844:ZÂMBROAIA, 134862:PROVIŢA DE JOS, 134871:DRÃGÃNEASA, 134880:PIATRA, 134906:PROVIŢA DE SUS, 134915:IZVORU, 134924:PLAIU, 134933:VALEA BRADULUI, 134951:PUCHENII MARI, 134960:MIROSLÃVEŞTI, 134979:MOARA, 134988:ODÃILE, 134997:PIETROŞANI, 135002:PUCHENII MICI, 135011:PUCHENII MOŞNENI, 135039:RÂFOV, 135048:ANTOFILOAIA, 135057:BUCHILAŞI, 135066:BUDA, 135075:GOGA, 135084:MÃLÃIEŞTI, 135093:MOARA DOMNEASCÃ, 135100:PALANCA, 135119:SICRITA, 135137:SALCIA, 135155:SÃLCIILE, 135173:SCORŢENI, 135182:BORDENII MARI, 135191:BORDENII MICI, 135208:MISLEA, 135217:SÂRCA, 135235:SECÃRIA, 135253:SÂNGERU, 135262:BUTUCI, 135271:MIREŞU MARE, 135280:MIREŞU MIC, 135299:PIATRA MICÃ, 135306:TISA, 135324:STARCHIOJD, 135333:BĂTRÂNI, 135342:BRÃDET, 135351:GRESIA, 135360:POIANA MARE, 135379:ROTAREA, 135388:VALEA ANEI, 135397:ZMEURET, 135413:SURANI, 135422:PÃCURI, 135440:ŞIRNA, 135459:BRÃTEŞTI, 135468:COCEANA, 135477:HÃBUD, 135486:TÃRICENI, 135495:VARNIŢA, 135510:ŞOIMARI, 135529:LOPATNIŢA, 135538:MÃGURA, 135556:ŞOTRILE, 135565:LUNCA MARE, 135574:PLAIU CÂMPINEI, 135583:PLAIU CORNULUI, 135592:SECIURI, 135609:VISTIERU, 135627:ŞTEFEŞTI, 135636:SCURTEŞTI, 135645:TÂRŞORENI, 135663:TALEA, 135672:PLAIU, 135690:TÃTARU, 135707:PODGORIA, 135716:SILIŞTEA, 135734:TEIŞANI, 135743:BUGHEA DE SUS, 135752:OLTENI, 135761:ŞTUBEIU, 135770:VALEA STÂLPULUI, 135798:TELEGA, 135805:BOŞILCEŞTI, 135814:BUŞTENARI, 135823:DOFTANA, 135832:MELICEŞTI, 135841:ŢONŢEŞTI, 135869:TINOSU, 135878:PREDEŞTI, 135887:PISCULEŞTI, 135903:TOMŞANI, 135912:LOLOIASCA, 135921:MAGULA, 135930:SÃTUCU, 135958:VALEA CÃLUGÃREASCÃ, 135967:ARVA, 135976:COSLEGI, 135985:DÂRVARI, 135994:PANTAZI, 136009:RACHIERI, 136018:RADILA, 136027:SCHIAU, 136036:VALEA LARGÃ, 136045:VALEA MANTEI, 136054:VALEA NICOVANI, 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137862:GIURTELECU HODODULUI, 137871:LELEI, 137880:NADIŞU HODODULUI, 137906:HOMORODU DE MIJLOC, 137915:CHILIA, 137924:HOMORODU DE JOS, 137933:HOMORODU DE SUS, 137942:NECOPOI, 137951:SOLDUBA, 137979:LAZURI, 137988:BERCU, 137997:NISIPENI, 138002:NOROIENI, 138011:PELEŞ, 138020:PELIŞOR, 138048:LIVADA, 138057:AD

RIAN, 138066:DUMBRAVA, 138075:LIVADA MICÃ, 138093:MEDIEŞU AURIT, 138100:BÃBÃŞEŞTI, 138119:IOJIB, 138128:MEDIEŞ RÂTURI, 138137:MEDIEŞ VII, 138146:POTÃU, 138155:ROMÂNEŞTI, 138173:MICULA, 138182:BERCU NOU, 138191:MICULA NOUÃ, 138217:MOFTINU MIC, 138226:DOMÃNEŞTI, 138235:GHILVACI, 138244:GHIROLT, 138253:ISTRÃU, 138262:MOFTINU MARE, 138271:SÂNMICLÃUŞ, 138299:ODOREU, 138306:BERINDAN, 138315:CUCU, 138324:ETENI, 138333:MÃRTINEŞTI, 138342:VÂNÃTOREŞTI, 138360:ORAŞU NOU, 138379:ORAŞU NOU-VII, 138388:PRILOG, 138397:PRILOG VII, 138404:RACŞA, 138413:RACŞA VII, 138422:REMETEA OAŞULUI, 138440:PÃULEŞTI, 138459:AMAŢI, 138468:AMBUD, 138477:HRIP, 138486:PETIN, 138495:RUŞENI, 138510:PETREŞTI, 138529:DINDEŞTIU MIC, 138547:PIR, 138556:PIRU NOU, 138565:SÃRVÃZEL, 138583:PIŞCOLT, 138592:RESIGHEA, 138609:SCÃRIŞOARA NOUÃ, 138627:POMI, 138636:ACIUA, 138645:BICÃU, 138654:BORLEŞTI, 138672:SANISLÃU, 138681:BEREA, 138690:CIUMEŞTI, 138707:HOREA, 138716:MARNA NOUÃ, 138725:VIIŞOARA, 138743:SANTÃU, 138752:CHEREUŞA, 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141973:MARCA-HUTA, 141982:PORŢ, 141991:ŞUMAL, 142015:MÃERIŞTE, 142024:CRIŞTELEC, 142033:DOH, 142042:GIURTELECU ŞIMLEULUI, 142051:MÃLÃDIA, 142060:UILEACU ŞIMLEULUI, 142088:MESEŞENII DE JOS, 142097:AGHIREŞ, 142104:FETINDIA, 142113:MESEŞENII DE SUS, 142131:MIRŞID, 142140:FIRMINIŞ, 142159:MOIGRAD-POROLISSUM, 142168:POPENI, 142186:NÃPRADEA, 142195:CHEUD, 142202:SOMEŞ-GURUSLÃU, 142211:TRANIŞ, 142220:VÃDURELE, 142248:NUŞFALÃU, 142257:BILGHEZ, 142266:BOGHIŞ, 142275:BOZIEŞ, 142293:PERICEI, 142300:BÃDÃCIN, 142319:PERICEIU MIC, 142328:SICI, 142346:PLOPIŞ, 142355:FÃGETU, 142364:IAZ, 142382:POIANA BLENCHII, 142391:FÃLCUŞA, 142408:GOSTILA, 142417:MÃGURA, 142435:ROMÂNAŞI, 142444:CHICHIŞA, 142453:CIUMÃRNA, 142462:PÃUŞA, 142471:POARTA SÃLAJULUI, 142480:ROMITA, 142505:RUS, 142514:BUZAŞ, 142523:FÂNTÂNELE-RUS, 142532:HÃŞMAŞ, 142541:ŞIMIŞNA, 142569:SÃLÃŢIG, 142578:BULGARI, 142587:DEJA, 142596:MINEU, 142603:NOŢIG, 142621:SÂG, 142630:FIZEŞ, 142649:MAL, 142658:SÂRBI, 142667:TUSA, 142685:SÂNMIHAIU ALMAŞULUI, 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SUS, 147232:PÂRÂU NEGREI, 147250:BRODINA, 147269:BRODINA DE JOS, 147278:CUNUNSCHI, 147287:DUBIUŞCA, 147296:EHREŞTE, 147303:FALCÃU, 147312:NOROCU, 147321:PALTIN, 147330:SADÃU, 147349:ZALOMESTRA, 147367:BROŞTENI, 147376:COTÂRGAŞI, 147385:DÂRMOXA, 147394:FRASIN, 147401:HÃLEASA, 147410:HOLDA, 147429:HOLDIŢA, 147438:LUNGENI, 147447:NEAGRA, 147456:PIETROASA, 147474:BUNEŞTI, 147483:PETIA, 147492:PODENI, 147508:ŞES, 147517:UNCEŞTI, 147535:PÂRTEŞTII DE SUS, 147544:CACICA, 147553:MAIDAN, 147562:RUNCU, 147571:SOLONEŢU NOU, 147599:CALAFINDEŞTI, 147606:BOTOŞANIŢA MARE, 147615:CÃLINEŞTI, 147624:ŞERBÃUŢI, 147642:CAJVANA, 147651:CODRU, 147679:ILIŞEŞTI, 147688:BÃLÃCEANA, 147697:BRAŞCA, 147704:CIPRIAN PORUMBESCU, 147722:CÂRLIBABA, 147731:CÂRLIBABA NOUÃ, 147740:IEDU, 147759:ŞESURI, 147768:ŢIBÃU, 147777:VALEA STÂNEI, 147795:CORNU LUNCII, 147802:BÃIŞEŞTI, 147811:BRÃIEŞTI, 147820:DUMBRAVA, 147839:PÃISENI, 147848:SASCA MARE, 147857:SASCA MICÃ, 147866:SASCA NOUÃ, 147875:ŞINCA, 147893:CRUCEA, 147900:CHIRIL, 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PUTNEI, 149977:PREUTEŞTI, 149986:ARGHIRA, 149995:BASARABI, 150007:BAHNA ARIN, 150016:HÂRTOP, 150025:HUŞI, 150034:LEUCUŞEŞTI, 150052:PUTNA, 150061:GURA PUTNEI, 150089:RÃDÃŞENI, 150098:LÃMÃŞENI, 150105:POCOLENI, 150123:RÂŞCA, 150132:BUDA, 150141:DUMBRÃVENI, 150150:JAHALIA, 150169:SLÃTIOARA, 150187:SADOVA, 150203:SATU MARE, 150212:ŢIBENI, 150230:SIMINICEA, 150249:GRIGOREŞTI, 150267:SLATINA, 150276:GÃINEŞTI, 150285:HERLA, 150301:STRAJA, 150329:STROIEŞTI, 150338:VÂLCELELE, 150347:ZAHAREŞTI, 150365:STULPICANI, 150374:GEMENEA, 150383:NEGRILEASA, 150392:SLÃTIOARA, 150409:VADU NEGRILESEI, 150427:SUCEVIŢA, 150436:VOIEVODEASA, 150454:NEAGRA ŞARULUI, 150463:GURA HAITII, 150472:PLAIU ŞARULUI, 150481:SÃRIŞOR, 150490:SÃRIŞORU MARE, 150506:ŞARU BUCOVINEI, 150515:ŞARU DORNEI, 150533:TODIREŞTI, 150542:COSTÂNA, 150551:PÃRHÃUŢI, 150560:SÂRGHIEŞTI, 150579:SOLONEŢ, 150597:UDEŞTI, 150604:CHILIŞENI, 150613:LUNCUŞOARA, 150622:MÃNÃSTIOARA, 150631:PLÃVÃLARI, 150640:POIENI-SUCEAVA, 150659:RACOVA, 150668:REUSENI, 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BÃLCESCU, 152476:CÃLMÃŢUIU DE SUS, 152485:BÃCÃLEŞTI, 152494:IONAŞCU, 152519:CERVENIA, 152537:CIOLÃNEŞTII DIN DEAL, 152546:BALDOVINEŞTI, 152555:CIOLÃNEŞTII DIN VALE, 152573:CONŢEŞTI, 152591:COSMEŞTI, 152608:CIUPERCENI, 152626:CRÂNGENI, 152635:BALTA SÃRATÃ, 152644:DOROBANŢU, 152653:STEJARU, 152671:CRÂNGU, 152680:DRACEA, 152699:FLORICA, 152706:SECARA, 152715:ZLATA, 152733:DIDEŞTI, 152742:ÎNSURÃŢEI, 152751:SATU NOU, 152779:DOBROTEŞTI, 152788:MERIŞANI, 152804:DRÃCŞENEI, 152813:BE

UCA, 152822:DRÃCŞANI, 152831:ODOBEASCA, 152840:PLOPI, 152859:SATUL VECHI, 152877:DRÃGÃNEŞTI DE VEDE, 152886:MÃGURA CU LILIAC, 152895:VÃCÃREŞTI, 152911:DRÃGÃNEŞTI-VLAŞCA, 152920:COMOARA, 152939:VÃCENI, 152957:FURCULEŞTI, 152966:MOŞTENI, 152975:SPÃTÃREI, 152984:VOIEVODA, 153008:FRUMOASA, 153017:PÃULEASCA, 153035:GÃLÃTENI, 153044:BÂSCOVENI, 153053:GRÃDIŞTEANCA, 153071:GRATIA, 153080:CIURARI-DEAL, 153099:DRÃGHINEŞTI, 153115:IZVOARELE, 153133:LISA, 153142:VÂNÃTORI, 153160:LUNCA, 153179:PLEAŞOV, 153188:PRUNDU, 153197:SAELELE, 153213:MAVRODIN, 153222:NENCIULEŞTI, 153231:PÃRU ROTUND, 153259:MÃGURA, 153268:GURUIENI, 153286:MÃLDÃENI, 153302:MERENII DE JOS, 153311:MERENII DE SUS, 153320:ŞTEFENI, 153348:MÂRZÃNEŞTI, 153357:CERNETU, 153366:TELEORMANU, 153375:VALEA PÃRULUI, 153393:MOŞTENI, 153419:NÃSTURELU, 153428:ZIMNICELE, 153446:NECŞEŞTI, 153455:BELCIUG, 153464:GÂRDEŞTI, 153482:OLTENI, 153491:PERII BROŞTENI, 153516:ORBEASCA DE JOS, 153525:LÃCENI, 153534:ORBEASCA DE SUS, 153552:PERETU, 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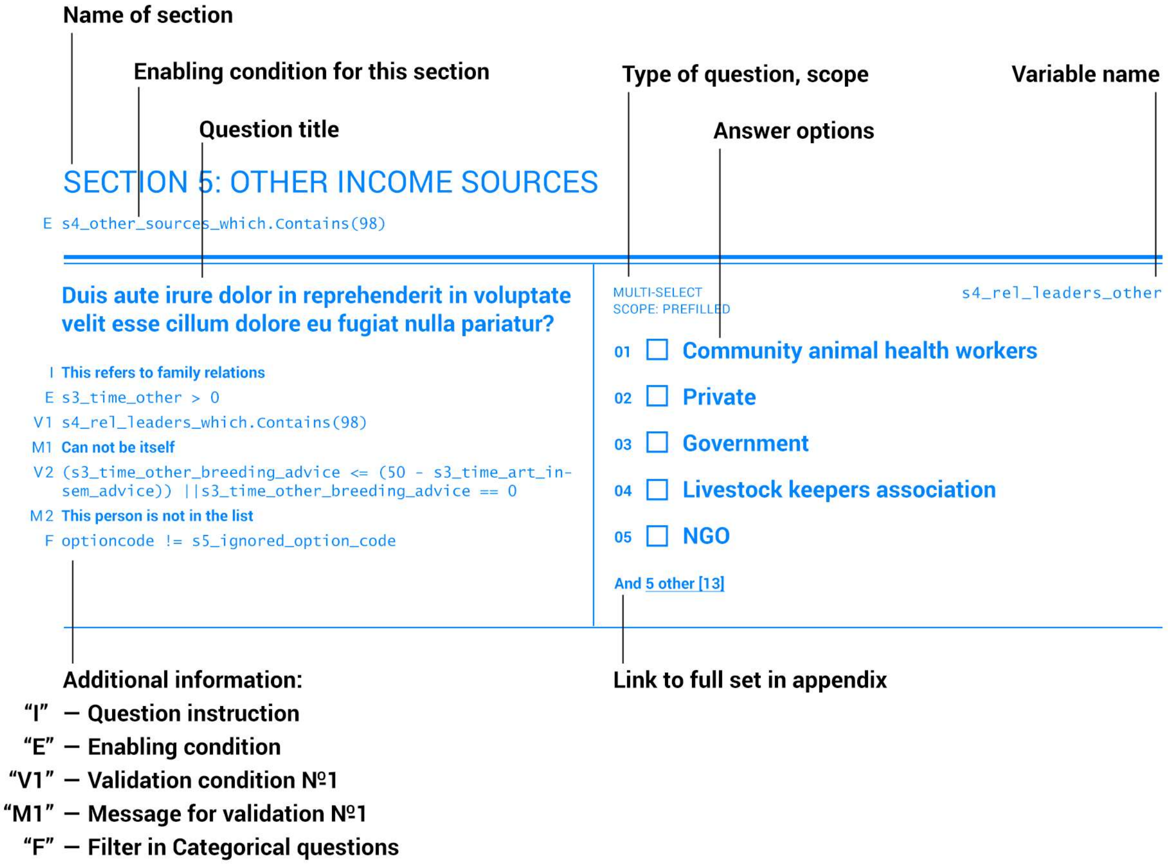
178741:RÂMNICEANCA, 178769:VRÂNCIOAIA, 178778:BODEŞTI, 178787:MUNCEI, 178796:PLOŞTINA, 178803:POIANA, 178812:SPINEŞTI, 178830:VULTURU, 178849:BOŢÂRLÃU, 178858:HÂNGULEŞTI, 178867:MALURI, 178876:VADU ROŞCA, 179141:BUCUREŞTI SECTORUL 1, 179150:BUCUREŞTI SECTORUL 2, 179169:BUCUREŞTI SECTORUL 3, 179178:BUCUREŞTI SECTORUL 4, 179187:BUCUREŞTI SECTORUL 5, 179196:BUCUREŞTI SECTORUL 6, 179230:BRAGADIRU, 179258:CHIAJNA, 179267:DUDU, 179276:ROŞU, 179294:CHITILA, 179301:RUDENI, 179329:DOBROEŞTI, 179338:FUNDENI, 179356:GLINA, 179365:CÃŢELU, 179374:MANOLACHE, 179392:JILAVA, 179418:MÃGURELE, 179427:ALUNIŞU, 179436:DUMITRANA, 179445:PRUNI, 179454:VÂRTEJU, 179472:MOGOŞOAIA, 179490:OTOPENI, 179506:ODÃILE, 179524:PANTELIMON, 179542:POPEŞTI LEORDENI, 179560:VOLUNTARI, 180073:SALTA, 180082:COMASCA

APPENDIX C — CATEGORIES FILTERS

[1] flq_06: 5.Who is the %rostertitle%'s father?
// select male flq_02==1 && // Cannot select his/herself as father @current.@rowcode!=@rowcode && // Show members 14 years older then current member (flq_04!=null ? (flq_04 - 14) >= @current.flq_04 : true)

LEGEND

Legend and structure of information in this file



Name of section

Enabling condition for this section

Question title

Type of question, scope

Variable name

Answer options

SECTION 5: OTHER INCOME SOURCES

E `s4_other_sources_which.Contains(98)`

Duis aute irure dolor in reprehenderit in voluptate velit esse cillum dolore eu fugiat nulla pariatur?

I This refers to family relations
E `s3_time_other > 0`
V1 `s4_rel_leaders_which.Contains(98)`
M1 Can not be itself
V2 `(s3_time_other_breeding_advice <= (50 - s3_time_art_insem_advice)) ||s3_time_other_breeding_advice == 0`
M2 This person is not in the list
F `optioncode != s5_ignored_option_code`

MULTI-SELECT
SCOPE: PREFILLED

`s4_rel_leaders_other`

01 □ Community animal health workers

02 □ Private

03 □ Government

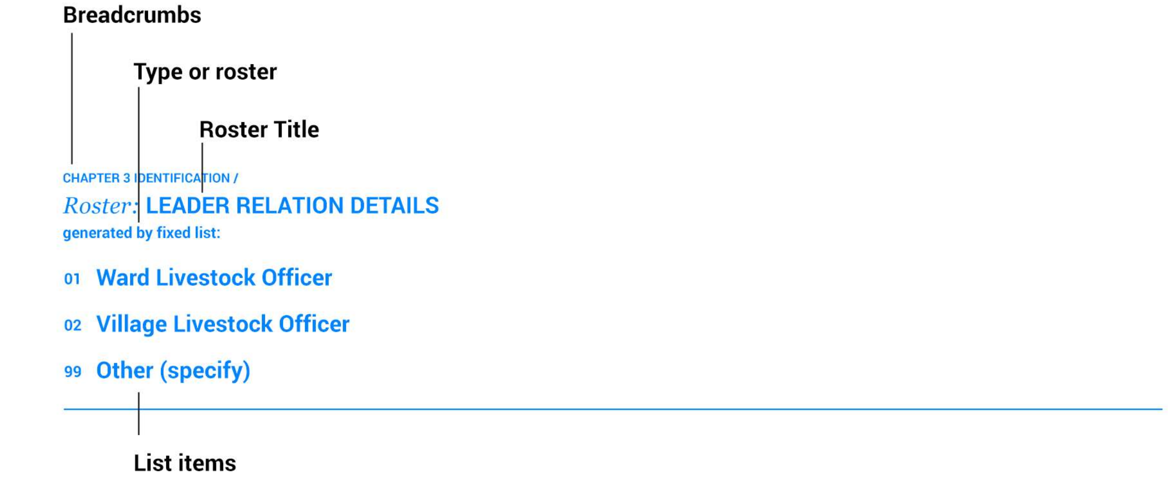
04 □ Livestock keepers association

05 □ NGO

And 5 other [13]

Additional information:
"I" — Question instruction
"E" — Enabling condition
"V1" — Validation condition №1
"M1" — Message for validation №1
"F" — Filter in Categorical questions

Link to full set in appendix



Breadcrumbs

Type or roster

Roster Title

CHAPTER 3 IDENTIFICATION /

Roster: LEADER RELATION DETAILS

generated by fixed list:

01 Ward Livestock Officer

02 Village Livestock Officer

99 Other (specify)

List items