SPSS for Windows 7.5 SAMPLE SESSION

Cross-Sectional Analysis

Short Course Training Materials
Designing Policy Relevant Research and
Data Processing and Analysis with SPSS for Windows 7.5
3rd Edition

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Components of the Cross-Sectional Training Materials

Section 0 - Introduction to the file structure for SPSS for Windows 7.5 (Data and Syntax Editors and Output Navigator). Must be read before starting the sample session

Section 1 - Basic functions

Section 2 - Table Lookup & Aggregation

Section 3 - Tables & Multiple Response Questions

Section 4 - Graphs, tables, publications and presentations, how to bring them into word processor.

Annexes

- Presentation of filters versus temporary selections, graphing and data in chart options, and manipulating the output in SPSS for Windows 7.5

- Three pages from the socio-economic survey of the smallholder survey in the province of Nampula, Mozambique (NDAE Working Paper 3, 1992).

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SPSS for Windows SAMPLE SESSION
SECTION 0 - Levels, time series and file structure for SPSS for Windows 7.5
(Data, Syntax and Output windows)

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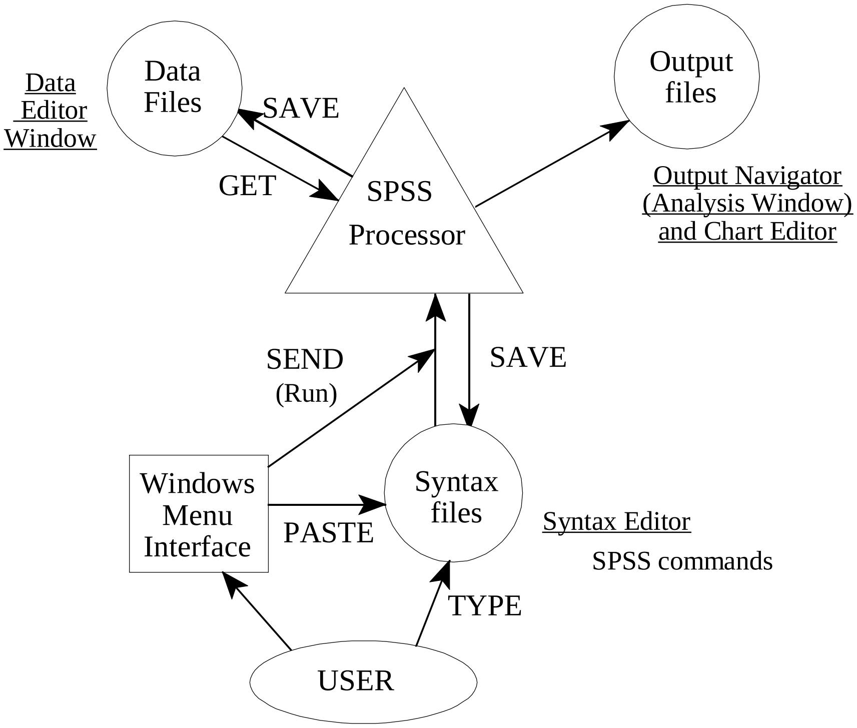
The following module introduces the basic concepts of levels, the notion of time series and consequently, the methods of data organization. This module gives a brief description of the file structure of SPSS for Windows version 7.5. It is essential that you read through this module before starting the time series sample session.

Files Used In SPSS for Windows 7.5

While using SPSS for Windows 7.5 in the manner taught in this tutorial, you are dealing with three different windows within the program—the Syntax Editor, the Data Editor window and the Output Navigator (including charts), the contents of each can be saved into the appropriate SPSS for Windows 7.5 file type. It is important to recognize the significance of the different types of files and to understand the various commands you use to create and access the files.



The Syntax Editor

The Syntax Editor is where commands are written before they are submitted to the SPSS processor. To put commands in the Syntax Editor you can **type** the commands directly into the Syntax Editor or you can use the pull down menus and select **Paste** when you are finished customizing the command. There are four main uses of the Syntax Editor:

- To type or paste commands for later processing by SPSS for Windows 7.5,
- To send these commands to SPSS for Windows 7.5 for processing,
- To write, or save, these commands to a file for future use, and
- To retrieve files of commands that you have saved previously.

It is important to understand that the commands you put in the Syntax Editor will not be executed (no output will be produced) until you send the commands to the processor. The Syntax Editor is simply an area that helps you prepare the commands. To send the commands to the processor, you use the Run button on the SPSS for Windows 7.5 Toolbar. Once you press the Run button, the computer sends the command(s) to the processor, which reads the commands written in the Syntax Editor and executes them. When all the commands have been processed, SPSS leaves you in the

Output Navigator to examine the results of your command. You can then switch back to the Syntax Editor and add new commands or edit old ones and execute these changes to observe different results.

When you have successfully completed each step in your analysis (or when you are ready to end an SPSS for Windows 7.5 session, even if it was not completely successful) you should save the commands to a file for future use. To save the commands, make the Syntax Editor active and select **Save** from the File menu. A file created from the Syntax Editor is called the *syntax (or command) file*. It is a file containing only commands; it never contains any of the data you may be analyzing with the commands. You must save your data separately, as described in the following section. We suggest that you use the default *extension* of `.SPS` when naming syntax files. `REP7.SPS`, `DEM-ALL.SPS`, and `SECTION1.SPS` are some examples.

By writing your commands to a syntax file, you can retrieve, look at, or modify sets of commands and rerun them. You can retrieve a syntax file by pulling down the File menu from any of the SPSS windows and selecting **Open**. In the **Files of type** scroll-down menu box, select **Syntax(*.sps)** and retrieve the filename under which you had last saved the file. Once you have opened a specific file, you can use the commands from the file, without having to type them again. If you make changes to the Syntax file that you wish to keep, make sure you save them to disk again.

The Data Editor Window

SPSS for Windows 7.5 stores your data in a *data file*. In addition to the values themselves, a data file contains such things as variable labels and value labels, formatting information, missing-value specifications, etc. To do any data analysis in SPSS for Windows 7.5, you must first tell SPSS to open a Data file. You do this by pulling down the File menu, selecting **Open** (and then either pasting the command to the Syntax Editor and running the command, or running the command directly from the dialog box by clicking on the **Open** button). After running this command, the data in the file is available to SPSS for Windows 7.5 in the Data Editor window.

You will often get a data file, then compute new variables and do other transformations, and finally want to save the modified set of data for later use. For example, you might retrieve a data file with land area per crop, add to it, production per crop from another file, and then calculate yield. If you want to use these new production and yield variables at a later time, you must make sure that the data file is saved with the new variables in it. You do this by having the Data Editor window active and selecting **Save As...** from the File menu and giving the file a new name. Or you may choose to write over the old file by saving the file keeping the same file name.

The Output Navigator

SPSS for Windows 7.5 automatically writes all messages and output that result from the execution of your commands to the Output Navigator. For example, if you run a frequency command, then the frequency table you specify will be written to the Output Navigator. Similarly, if you generate a table or a graph, the table or graph will appear in the Output Navigator. To save the contents of the Output Navigator to a file, make the Output Navigator active, pull down the File menu and select **Save As...**. When you give the file a name, SPSS will automatically attach the *extension* `.SPO`. It is very important to save the *output file*. The Output file gives you access to your results after your SPSS for Windows 7.5 session has ended. For example, you can print the output of your session in order to examine the results and verify for errors. In the sample session, you will see how to save the contents of the Output Navigator and give the file from each session a different name. One final note, you can manipulate the output produced just as if you were using a file manager (called explorer in Windows 95). In the Output Navigator, there are two boxes: the one on the right produces the results, the one on the left lets you manage the results, deleting data, renaming titles, moving results around, etc.

Summary of the File Types

Syntax files (or command files) contain commands saved in the Syntax Editor. They do not contain output or data—only commands. Like in SPSS 6.1.3., the extensions are *.SPS (was *.LOG in SPSS/PC+).

Output files contain statistical output, data information and presentation (tables, graphs, charts), generated by the SPSS for Windows 7.5 processor, given selected commands. They do not contain data. The new extensions are *.SPO (was *.LIS in SPSS/PC+ and *.LST in SPSS 6.1.3).

Data files contain data, including original survey variables plus new created variables through various SPSS for Windows 7.5 commands such as the `COMPUTE` or `AGGREGATE` commands. Data files are made accessible to SPSS for Windows with a **Open...** command. For SPSS 6.1.3. and 7.5., the extensions are *.SAV (was *.SYS for SPSS/PC+).

*Nota bene - Versions of SPSS software. Although originally written for SPSS 6.1.x, the versions available for download were re-written for SPSS 7.5.x. If you are using a newer version of SPSS 8.x or 9.x, please note the following:

For SPSS 8.x users, you may continue to follow the short courses, versions of SPSS 7.5.x and 8.x are compatible. The only changes in syntax across these versions involves the addition of new commands (most prominently, IGRAPH in SPSS 8.x), which are not included in the sample sessions. There may be some changes to sub-commands scattered across the many existing procedures but they are very few. The same is true for the menu options between 7.5.x and 8.x; most changes are to accommodate new procedures.

For SPSS 9.x users, SPSS did change the Statistics menu extensively, calling it "Analyze," and reordering some of the choices. The documentation for the short courses were developed with pre-SPSS 9.x menus, and might be confusing for SPSS 9.x users. The sample sessions may still be used but extra effort is required by the user to translate the pre-SPSS 9.x Statistics commands to work with the new "Analyze" menu commands, in most cases, simply by replacing the word Statistics for Analyze.

SPSS for Windows SAMPLE SESSION

CROSS-SECTIONAL ANALYSIS

Agricultural Economics Department and Computer Service
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This is a self-paced training aid designed to introduce the commands needed for some typical survey analysis processes in SPSS for Windows **7.5**. To use it most effectively, you will need a knowledgeable SPSS for Windows user to help you get started and to answer questions while you work independently through the session. It is nonetheless partly intended to be a completely stand-alone training tool, although it may also be used as a guide for classroom training.

A copy of the questionnaire on which the data is based can be found in the Mozambique project 1992 **NDAE Working Paper 3: A Socio-economic survey of the smallholder survey in the province of Nampula: Research Methods**, copies of the three tables which were made available and can be found at the end of the manual in the annex section (for further information please contact Dr. Weber at webermi@pilot.msu.edu). Four portions of the questionnaire are referenced, each of which has a corresponding SPSS for Windows data file. Two other SPSS for Windows data files are required for conversion of units of measure.

Questionnaire Section	SPSS for Windows Data File
Main Household Section	C-HH.SAV
Table IA: Household Member Characteristics	C-Q1A.SAV
Table IV: Characteristics of Production	C-Q4.SAV
Table V: Sales of Farm Products	C-Q5.SAV
Conversion factors for computing kilograms	CONVER.SAV
Conversion factors for computing calories	CALORIES.SAV

This training is broken into three sections, each of which should take approximately two hours. We recommend that you complete each section in a single sitting. These sessions make the following assumptions:

- You know how to use Windows with a mouse
- The six data files above are stored in the directory C:\SAMPLE on your hard disk.

  If you have not do so already, you need to copy the files from sample.zip to this directory.
- Preferences in SPSS are set to list variables in the same order they are listed in the file
- Preferences in SPSS are set to list commands in the Output Navigator

  You can modify any of the Preferences using **Edit/Options...** from the menu system.
- Syntax Editor does not come up at start

Important: Always remember to SAVE the changes to the data after each exercise and module, using a new file name. If you are not sure of the above have the person helping you check them or refer to your nearest computer service center.

SPSS for Windows SAMPLE SESSION
SECTION 1 - Basic functions: SPSS files, Descriptives and Data Transformation

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February 1999

Open your SPSS software. If you have not read or completed Section 0, please do so now to clarify the concept of the Syntax Editor, where you paste or type commands, the Output Navigator where SPSS for Windows displays the results of your commands and the Data Editor window where the working data file is displayed.

Data Files and the Working File

Data from questionnaires that has been entered into SPSS for Windows 7.5 is stored in what are called *data files*. If we want to work with a set of data, we must open the corresponding data file, so that it is available to the program.

When a data file is opened, it is loaded from the disk into memory (the computer's "RAM"), making it the working file. This means that the data from this file is now available for you to use. Let's start with the questionnaire for Table IA: Household Member Characteristics. The data file that corresponds to it is C-Q1A.SAV. To open this file, perform the following steps:

1. From the **File** menu, select **Open...**
   This will open the Open File *dialog box.*
2. Change to the directory your sample session data is in and select the file c-q1a.sav.
3. Click on the **Paste** button to place the command in the Syntax Editor.
   The Syntax *Editor will now become the active window and you will see the text*
   ```
   GET
     FILE='C:\SAMPLE\C-Q1A.SAV'.
   EXECUTE .
   ```
   in the Syntax *Editor.*
4. Place the cursor anywhere on the line containing the "GET" command and click on the Run ▸ button on the Toolbar.
   Note that the GET FILE *command you just ran will be written to the Output Navigator.*

The household-member data file is now in memory.

One key thing we often want to know about a data file is what variables it contains. We can find this out, along with other information, by using the **Variables...** command on the **Utilities** menu, in both the Syntax Editor and the Data Editor. It lets you browse through the variable definitions and variable labels. To do this, perform the following steps:

1. From the **Utilities** menu select **Variables...**
2. Select a variable name, and the information about that variable will appear to the right.

This display shows additional information, including the value labels for variables like **district**, **vil**, **ca1**, **ca2**, **ca4**, **ca5**, **ca6**, and **univ**, the type of variable, the display width of the variable in characters, the number of decimal places (if Type is Numeric), and any missing values.

Click on the **Close** button when you are finished.

To have all of this information written to your Output Navigator for later examination, do the following:

Pull down the **Utilities** menu and select **File Info**.
This command will execute immediately. The Output *Navigator will become active and will contain a listing of all the variables with their definitions.*

This information is included in your Output Navigator. You can see the name of each of the variables, their labels, and the various formats, e.g. F8.2 means width 8 with two decimal places. Displaying and saving this information about your files provides you with one way to document your data files.

Descriptive Statistics - involving one variable

The first thing to do when starting analysis is to get descriptive statistics (e.g. averages, maximum, minimum, and standard deviations) for all variables. This type of analysis helps you to find data entry errors, to give you a "feel" for what your data is like, to see that missing values have been defined correctly, etc. It may be tempting to skip this step for some data sets or for some variables, but this is an important step that will almost always save time later and improve analysis. For example, finding out the average age of all respondents may not be something you are interested in knowing, but if the average age turns out to be 91.3 yrs, this would alert you that something is probably wrong.

Basic descriptive statistics can be obtained from two common SPSS for Windows commands—**Descriptives** and **Frequencies**. **Descriptives** is used for continuous variables, while **Frequencies** is used for categorical variables.

A *continuous variable* is a variable that does not have a fixed number of values. A *categorical variable* is a variable that has a limited number of values that form categories. For example, look at the Table IA: Household Member questionnaire. Variable **ca3**, age, is a continuous variable because age can take on many different values. Variable **ca2**, relation to head, is a categorical variable because its values are limited to the categories 1-6.

Start by examining the data in the file. Use the Data Editor window to scroll through your data file. To do this, perform the following steps:

1. Click on the Go To Data Editor ▦ button on the Toolbar.
2. Scroll through the data.
   A period in a field indicates a missing value or sysmis.

This will give you a "feel" for what your data is like. It might also help point out obvious errors, e.g. a variable whose values are missing for all listed cases. Decide which of the variables are continuous and which are categorical (normally you would refer to the questionnaire to make this decision). You need to know this in order to select the right procedure to use for each variable. If you mistakenly perform a **Frequencies** on a continuous variable, you will probably get more output than you really want, with possibly hundreds of different "categories", one for each different value found. If you perform a **Descriptives** on a categorical variable, you will usually get meaningless results, since the average value of a variable that consists of categories has no real significance.

By examining the data, you should have found that variable **ca3** is continuous and the remaining variables are categorical. To run descriptives on **ca3,** do the following:

1. From the **Statistics** menu select **Summarize/Descriptives...**.
   This will give you the Descriptives *dialog box.*
2. Select **ca3** from the list on the left and click on the ▶ button.
   ca3 will move to the Variable(s): *box on the right*
3. Click on the **Paste** button to put the command into the Syntax window and make the Syntax Editor active by clicking on the syntax button on the windows taskbar.
4. Execute the command by clicking on the Run ▸ button located on the Toolbar. (Note that this time we did not have to move the cursor since it was already positioned in one of the lines of the **Descriptives** command.)

The Output Navigator will become active and the results of the command will be there. You will see that the mean for **ca3** is 21.34.

5. Another useful way to examine a continuous variable is to run a Frequency command to view a histogram and the distribution of a variable. From the **Statistics** menu select **Summarize/Frequencies...**.
6. Select **ca3** from the list on the left and click on the ▶ button.
7. Click on **Charts** button and select Histograms, click on the **Continue** button.
8. Click on **Paste** to put the command into the Syntax Editor and make it active.
9. Execute the command by clicking on the Run ▸ button located on the Toolbar. View the distribution.

Since the variables **ca1**, **ca2**, **ca4**, **ca5** and **ca6** are categorical, we will run a **Frequencies** on them. To run frequencies, do the following:

1. From the **Statistics** menu select **Summarize/Frequencies...**.
   This will give you the Frequencies *dialog box.*
2. Select **ca1** from the list on the left and click on the ▶ button.
   ca1 *will move to the* Variable(s): *box on the right*
3. Repeat step 2 until **ca2**, **ca4**, **ca5** and **ca6** have all been moved to the Variable(s): box.

4. Click on **Paste** to put the command into the Syntax Editor and make it active.
5. Execute the command by clicking on the Run ▸ button located on the Toolbar.

The Output Navigator will become active and the results of the command will be there. You will see, for example, that **ca1** shows that 70.7% of the household members work and that **ca6** shows 38.0% of those surveyed have monogamous marriages.

For a complete description of the output you receive from **Descriptives** and **Frequencies** refer to the SPSS for Windows Base System User's Guide Release 7.5 pages 161-169. Another command used to produce many types of descriptive statistics is the **Explore** command. One of the most useful statistics it produces is finding *outliers*. The **Explore** command can produce large amounts of output if used with its defaults. We will limit the output to statistics.
Run the **Explore** command on the age variable **ca3** using the following steps:

1. From the **Statistics** menu select **Summarize/Explore...**
2. Select **ca3** from the list on the left and click on the ▶ next to Dependent List.
3. In the lower left corner of the dialog box is a box called Display. Click on the radio button (circle) next to Statistics.
   This will give us statistics only and no plots.
4. Next click on the **Statistics...** button.
   This will bring up the Explore:Statistics *dialog box.*
5. Click once on the square next to Outliers to put an X in the box.
   You will notice there is already an X in the box next to Descriptives*.*
6. Click on the **Continue** button.
   This will bring you back to the Explore *dialog box.*
7. Click on **Paste** to put the command in the Syntax Editor and make it active.
8. Click on ▸ Run.

This will show you the five highest and five lowest values occurring for **ca3**, so you can tell if you have any extreme *outliers*. They will be identified by their case numbers. Refer to pages 171-177 of the SPSS for Windows Base System User's Guide Release 7.5 for an explanation of the **Explore** command.

Apply what you've just learned about descriptive statistics by doing the following exercise.

Exercise 1.1: Run descriptive statistics on another sample file. Use the production questionnaire - Table IV, whose data is in file C-Q4.SAV.
Hints:

a. make C-Q4.SAV your working data file.
b. Use the **Descriptives** command for continuous variables, and **Frequencies** for categorical variables.
c. **Prod** is a categorical variable.
d. Quantities (**p1b**, **p2b**, ...) are continuous variables.
e. Units (**p1a**, **p2a**, ...) are categorical variables.
f. **p4** & **p6** are categorical variables.

A small sampling of what you should find out from running these frequencies and descriptive statistics follows:

PRODUCT

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	cotton	83	4,9	4,9	4,9
	peanuts	144	8,5	8,5	13,4
	rough rice	155	9,2	9,2	22,6
	bananas	50	3,0	3,0	25,5
	sweet potato	12	,7	,7	26,2
	cashew liquor	24	1,4	1,4	27,6
	sugar cane liquor	11	,6	,6	28,3
	dried cashew	2	,1	,1	28,4
	sugar cane	13	,8	,8	29,2
	cashew nut	130	7,7	7,7	36,9
	coconut	45	2,7	2,7	39,5
	beans	279	16,5	16,5	56,0
	manteiga beans	7	,4	,4	56,4
	sunflower	5	,3	,3	56,7
	oranges	13	,8	,8	57,5
	cashew fruit	44	2,6	2,6	60,1
	manioc	338	20,0	20,0	80,0
	sorghum	124	7,3	7,3	87,4
	maize	192	11,3	11,3	98,7
	"ossura"	5	,3	,3	99,0
	tobacco	4	,2	,2	99,2
	tomato	13	,8	,8	100,0
	Total	1693	100,0	100,0	
Total		1693	100,0		

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
PROD THIS YR - # OF UNITS	1670	,0	5000,0	26,353	163,436
PROD NORMAL YR - # OF UNITS	1598	,5	5000,0	22,815	159,510
STOCK ENTERING HARVEST - # OF UNITS	173	,0	30,0	2,523	4,575
STORED FOR CONS THIS YR - # OF UNITS	1231	,0	1460,0	15,612	86,104
STOCK FOR SEED - # OF UNITS	869	,0	100,0	4,938	6,876
Valid N (listwise)	151				

Descriptive Statistics - involving two or more variables

The **Crosstabs** command produces tables showing the distribution of cases according to their values for two or more categorical variables.

Look at the household member questionnaire in the annex section, TABLE IA. One thing you might be interested in knowing is how the sex of the respondents varied by their relationship to the head of household. This would tell you, for example, how many females are heads of households. This kind of summary can be produced using the **Crosstabs** command. Make the household member file, C-Q1A.SAV, the working data file.

1. Click on the open folder button in the top left of the Data Editor Taskbar
2. Select the file c-q1a.sav.
3. Click on **Paste** to place the command in the Syntax Editor and make it active.
4. Place the cursor anywhere on the line containing the `"GET"` command and click on the Run ▸ button on the Toolbar.

To use the **Crosstabs** command do the following:

1. Select **Summarize** from the **Statistics** menu
2. Select **Crosstabs...**
   This will bring up the Crosstabs *dialog box*
3. Select **ca4** from the list on the left and click on the ▶ next to Row(s):
4. Select **ca2** from the list on the left and click on the ▶ next to Column(s):
5. Click on the **Cells...** button
   This will bring up the Crosstabs:Cell Display dialog box
6. In the Counts section click on the box next to Observed to place an X in it, if there is not already one there.
7. In the Percentages section click on the boxes next to Row and Column to put X's in them.
8. Click on **Continue**
9. Click on **Paste**
10. Run the command in the Syntax Editor.

The Crosstabs:Cell Display dialog box specifies which statistics you want displayed in each cell of the table—in this case we wanted counts, row percentages, and column percentages. (Row percentages sum to 100 across all the cells in a row, while column percentages sum to 100 across all the cells in a column. By default the **Crosstabs** command just gives counts.) The table produced by this command tells you that there are 21 female heads of households, and that 6.1% of the total number of heads of households are female.

The **Compare Means** command is somewhat similar to **Crosstabs**, but it gives statistics about continuous variables. It shows how the mean and other statistics for a continuous variable differ by the values of one or more categorical variables. Another way to look at the relationship between **Crosstabs** and **Compare Means** is that, **Crosstabs** is a way of getting **Frequencies**-type output broken down by categories of one or more other variables, while **Compare Means** is a way of Getting **Descriptives**-type output broken down by categories of one or more other variables.

Suppose we want to know how the age of the respondents varied by their relationship to the head of household. If we did this with **Crosstabs** we would get a table with dozens of cells for the different ages represented, which would be an unusable format. Instead we will use **Compare Means**.

1. Select **Compare Means** from the **Statistics** menu
2. Select **Means...**
3. Select **ca3** and click on the ▶ next to Dependent List:
4. Select **ca2** and click on the ▶ next to Independent List:
5. Click on **Paste**
6. Run the command from the Syntax Editor

This command will calculate means of the dependent variable, which should normally be a continuous variable. The means will be calculated separately for each different value of the independent variable, which should be a categorical variable.

From this output you find that the average age of heads of households is 41.5 while the average age of their spouses is 33.2.

Data Transformations

After examining the results of the descriptive statistics you will often want to do data transformations. A data transformation is an operation that takes existing variables and either changes their values in a systematic way or uses their values to calculate new variables. The following example shows a common data transformation; the conversion of a continuous variable to a categorical variable.

The information we received from the **Means** command is interesting, but it might also be useful to see the actual distribution of the ages into groups or categories, so we can tell, for example, how many heads of household are older than 60. Since the age variable, **ca3**, is continuous, we cannot do this directly—first we have to transform it. Let's suppose we're interested in four categories: 0-10 years old, 11-19 years, 20-60 years, and over 60 years of age.

To categorize a variable, you use the **Recode** command. Categorizing a continuous variable makes detailed information more general. If you want to keep the detailed information as well as the new general information, you must recode the variable into a different variable. If you recode into the same variable the original values will be lost.

In this particular file, if you use the **Recode Into Same Variable** command to transform **ca3**, **ca3** will take on the new categorical values assigned in the **Recode** statement, and the original ages will be lost. Since we want to preserve the original ages and store the categorized values in a separate variable, we will **Recode Into A Different Variable**.

Let's **Recode** into a new variable called **age**.

1. Select **Recode** from the **Transform** menu
2. Select **Into Different Variables...**
3. Select **ca3** from the list on the left

4. Click on the ▶ next to Input Variable -> Output Variable: box
ca3 should move to the Input Variable->Output Variable: box *and the name of the box will change to Numeric Variable -> Output Variable.*
5. Click once in the empty box next to Name: in the Output Variable section to put the cursor there.
6. Type **age** in the box.
7. Click once in the empty box next to Label: in the Output Variable section.
8. Type Age Group in the box.
9. Click on **Change** to have the variable name and label changes take effect.
10. Click on **Old and New Values...**
The Recode into Different Variables: Old and New Values *dialog box will appear.*
11. In the Old Value section click on the circle next to Range: □ through □
Your cursor should be in the first box.
12. Type 0 in the first box
13. Press <Tab> and type 10 in the second box.
14. Press <Tab> twice.
Your cursor will now be in the box next to Value*: in the* New Value *section.*
***OR** you may press the "Alt" key leaving your finger on the key while you press the "l" key to bring you to the "New Value" box.*
15. Type 1 for the first age group.
16. Click once on **Add**
17. Click on the first box after Range: and repeat steps 11 through 16 to recode ages 11 thru 19 to 2 and ages 20 thru 60 to 3.
18. To recode ages 61 and up to 4, click on the circle next to Range: □ through highest
19. Enter 61 in the box and repeat steps 14 through 16 using 4 for the value.
20. Click on **Continue**
21. Click on **Paste**
22. Select the following text in the Syntax Editor

```
RECODE
  ca3
  (0 thru 10=1)  (11 thru 19=2)  (20 thru 60=3)  (61 thru Highest=4)  INTO
  age .
VARIABLE LABELS age 'age group'.
EXECUTE .
```

23. Run the command

Recode changes the values for **age** to the codes we want to use—1,2,3, and 4. We will switch to the Data Editor to view that the changes were made.

To switch to the Data Editor window (*we will use a different method than we used earlier*):

1. Select **c:\sample\q1a.sav** from the **Window** menu.
2. Scroll through the window with the scroll bars.

SPSS's standard format for displaying a numeric variable includes two decimal places, which is inappropriate for a variable we know will always have an integer value. To change the display format of **age** to the same format as our other variables use **Data/Define Variable...**

1. Switch to the Data window if you are not already there.
2. Click once on the gray bar where the variable name **age** appears.
3. Click on the **Data** menu.
4. Select **Define Variable...**
   The Define Variable *dialog box will appear for the variable* **age***.*
5. Click on **Type...**
   The Define Variable Type : age *dialog box will appear.*
6. In the box next to Width: type 1.
7. In the box next to Decimal Places: type 0
8. If the circle next to Numeric is not selected, select it.
9. Click on **Continue**
   We will complete this procedure in the next set of steps.

This tells SPSS for Windows to display **age** with a width of 1 digit and no decimal places. When you **Recode** a new variable, it does not have *Value Labels*. The statistical output from SPSS always includes the names of the variables being analyzed, but sometimes the name of a variable does not tell us as much as we would like to know. Since names are limited to eight characters, they may not be descriptive enough for us to remember the complete question from the questionnaire (e.g. the variable **ca4**). The name also does not tell us what the individual values of a categorical variable refer to. To make the output more understandable, we add *Variable Labels* and *Value Labels*. To avoid confusion and mistakes, you should always add labels for any computed variable that you are going to save for later use. The best time to add labels is immediately after you create the new variable, because if you postpone it you may forget. The recode command facilitates this by allowing you to add the **Variable Label** when you do the recode. To add the **Value Labels** use the following steps:

1. You should still be in the *Define Variable* dialog box from the last set of steps. Click on **Labels..** The Define Labels: age dialog box will appear.
2. If there is no text in the Variable Label: box, enter the text "Age Group" there.
   There should be text there since we created the label when we did the recode.
3. Go to Value: in the Value Labels section and type a 1
4. Press <Tab> once and type 0 to 10
5. Click on **Add**
   You will have noticed there are two other options available as well, **Remove** to delete a value and value label set, and **Change** to modify the value label for a specific value.
6. Repeat steps 3 through 5 using the following information:

Value:	Value Label:
2	11 to 19
3	20 to 60
4	61 and older

7. Click on **Continue**
8. Click on **OK** *(In the Data window you will see that age is now displayed as a single digit.)*
9. Select **Variables...** from the **Utilities** menu.
10. Click on **age** to verify the changes you just made.
11. Click on **Close** when you are finished.

This new variable is not yet part of the data file stored on disk. We must save the file in order for this variable to be included permanently in a new data file. It is a good practice to save a file under a different name in case we want to go back to a previous version of a file. For this reason we will use the **Save As** command with the new file name Q1A-AGE.SAV.

1. Make sure the Data Editor window is the one in front (the active window).
2. From the **File** menu select **Save As...**
   The cursor should be in the box under File name: *above the Save as type: SPSS (*.SAV) drop-down box. Typing while that area is highlighted will wipe out the current text.*
3. Type q1a-age (The .sav extension will be added automatically.)
4. Paste and run the command.

Now each time the data file Q1A-AGE.SAV is opened, the **age** variable will be included.

You might want to analyze this new categorical variable using the **Crosstabs** command to determine how many people in each age group are heads of households, spouses, or children.

1. Use **Statistics/Summarize/Crosstabs...** from the menus.
2. Use **age** for Rows and **ca2** for Columns.
3. Check the proper selections in the Cell section.
4. Paste the command and run it.

From this, you can see that 12% of heads of households are 61 years of age or older. Also, that of the people 61 years or older, 83.7% are heads of households.

Compare the information you get from this **Crosstabs** analysis with the information from the **Compare Means** command performed on **ca3** earlier. To do this, we will explore SPSS's ability to switch between the Syntax, Output and Data windows.

To switch to the Output Navigator:

1. From the **Window** menu select Output1 - SPSS Output Navigator.
2. Scroll back through the window with the scroll bars.
3. Find the Crosstabs table and compare with the Compare Means table.

To switch to the Syntax Editor:

1. From the **Window** menu select Syntax1 - SPSS Syntax Editor.
2. Scroll through the window with the scroll bars.

To switch to the Data Editor:

1. From the **Window** menu select C-q1a - SPSS Data Editor.
2. Scroll through the window with the scroll bars.

Please note it is also possible to switch from one window to another by clicking on the SPSS icons in the Windows 95 taskbar, found by default at the bottom of the screen (the taskbar may be moved to any sides of the screen).

Apply what you have learned about data transformations and descriptive statistics by doing the following exercise.

Exercise 1.2: Using the Household Data and Questionnaire (latter available in the annex), find out the number of households in each district that have 1-4, 5-7, and more than 7 persons per household. One way to find out this information is to create the following table.

Hints:
a. Use the file C-HH.SAV.
b. Recode **h1** into **hhsize** using the following groups: (1 thru 4) (5 thru 7) (8 thru Highest).
c. Add a variable label and value labels.
d. Run **Crosstabs** on this variable by **district**.

Household size * DISTRICT Crosstabulation

			DISTRICT			
			MONAPO	RIBAUE	ANGOCHE	Total
Household size	1 to 4 members	Count	65	48	74	187
		% within Household size	34,8%	25,7%	39,6%	100,0%
		% within DISTRICT	60,7%	40,3%	64,3%	54,8%
		% of Total	19,1%	14,1%	21,7%	54,8%
	5 to 7 members	Count	39	56	36	131
		% within Household size	29,8%	42,7%	27,5%	100,0%
		% within DISTRICT	36,4%	47,1%	31,3%	38,4%
		% of Total	11,4%	16,4%	10,6%	38,4%
	8 or more members	Count	3	15	5	23
		% within Household size	13,0%	65,2%	21,7%	100,0%
		% within DISTRICT	2,8%	12,6%	4,3%	6,7%
		% of Total	,9%	4,4%	1,5%	6,7%
Total		Count	107	119	115	341
		% within Household size	31,4%	34,9%	33,7%	100,0%
		% within DISTRICT	100,0%	100,0%	100,0%	100,0%
		% of Total	31,4%	34,9%	33,7%	100,0%

Looking at the results, you can see for Monapo for example, 34,8% of all 1 to 4 member households (group 1) are found within Monapo and that 60,7% of all households in Monapo have 1 to 4 members in a household.

Before exiting SPSS for Windows we should save the contents of the Output Navigator. The output window contains all of the command and the results of these commands. It is useful to keep this output in a file so you can review it later, print it or include it in a report.

1. Make the Output Navigator the active window using its icon in the Windows 95 taskbar.
2 From the **File** menu select **Save As...**
3 Enter the filename session1
The .spo extension will be added to the name automatically.
4. Click on **Save**

To exit SPSS for Windows:

1. From the **File** menu select Exit SPSS
A dialog box will prompt you to save the contents of C:\sample\c-hh.sav
2. Click on **No**
A dialog box will prompt you to save the contents of Syntax Editor to Syntax1*.*
3. Click on **Save** and give it a filename such as Module1.sps
SPSS for Windows will exit.

SPSS for Windows SAMPLE SESSION
SECTION 2 - Restructuring Data Files - Table Lookup & Aggregation

Short Course Training Materials
Designing Policy Relevant Research and
Data Processing and Analysis with SPSS for Windows 7.5
3rd Edition

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Some types of data analysis will require restructuring of the data files. The data from the four questionnaires—household, member, production and sales—are arranged in four separate data files because the data are at different levels. The household data is at the most general, or highest, level. The other three files contain more detailed data, which is usually thought of as being at a lower level. If you are not familiar with the concept of levels of data, read "Computer Analysis of Survey Data -- File Organization for Multi-Level Data" by Chris Wolf, before continuing.

The analysis we did in Section 1 was done at each level separately, using just the variables in a single file at a time. However, other types of analysis require combining data from more than one file. Let's look at an example.

Suppose we want to create a table of calories per adult equivalent produced per day from the principal food crops. Furthermore, we want to see how this varies by district and calorie-production quartile.

TABLE:1 Food Production in calories per adult equivalent per day

	Calorie Production Quartile			
Districts	1	2	3	4
Monapo				
Ribaue				
Angoche				

Given the data in the current form, many transformations will be needed to produce this table. This is a typical example of the complications you will encounter in real-world data analysis. This entire section will be devoted toward the goal of creating this table.

To begin, let's first take a look back at some of the files that we have and at the variables we need in each of these:

- C-Q1A.SAV: This file contains data on household member characteristics. It is at the household-member level. The variables **ca3**(age) and **ca4**(sex), are of use to us in this exercise for computing the number of adult equivalents per household.
- C-Q4.SAV: This file has household-product level variables, some of which we will need for this exercise. The variables we need are the following:

a. **prod**, containing codes for the agricultural crop produced.
b. **p1a**, containing codes for the unit in which the production was measured (100 kg sack, 50 kg sack, etc).
c. **p1b**, the number of units produced this year.

Note that the units of production are not standard units. For example, a "100 kg sack", as the term is used in Mozambique, weighs 100 kg only when filled with corn. When filled with manioc root for example, it weighs much less than 100 kg. Thus, we need *conversion factors* to be able to convert each of the units in which production was actually measured to our standard unit, which is the kilogram.

- CONVER.SAV: This is a *table-lookup file* of conversion factors specifically created to deal with the problem of non-standard units. It contains conversion factors equal to the weight in kilograms of each product in each unit in which it was observed. In other words, there is a different conversion factor for each product-unit combination. For example, the conversion factor for a 50 kg sack of rice is different from that for a 50 kg sack of cotton, which is different from that for a 50 kg sack of manioc root. The variables in this file are:
  a. **prod**: This variable refers to the product.
  b. **unit**: This variable refers to the unit.
  c. **conver**: This is the conversion factor, and is equal to the number of kilograms corresponding to each combination of **prod** and **unit**.

Below, a sample of data from CONVER.SAV shows that, a 20 liter can (**unit**=8) of rice (**prod**=7) weighs 19 kg; a 50 kg bag (**unit**=24) of rice weighs 53 kg; a 20 liter can of beans (**prod**=30) weighs 17 kg; and a 50 kg bag of beans weighs 47 kg.

prod (Product)	**unit** (unit)	**conver** (conversion factor)
...	...	...
...	...	...
7	8	19
7	24	53
...	...	...
...	...	...
30	8	17
30	24	47
...	...	...
...	...	...

- CALORIES.SAV: This also is a table-lookup file, created for converting kilograms of food into calories of food. It contains two variables:

  a. **prod**, the product variable
  b. **calories**, equal to the number of calories per kilogram of each of the foods recorded in the survey.

With this information in hand, we can now think about the specific steps we must take to create the table we want. Logically, there are three steps:

1. We need to know how many calories each household produced for the year. We can generate a file with this information using data we have stored in three places—the production file, C-Q4.SAV, and two table-lookup files, CONVER.SAV and CALORIES.SAV.
2. We need to know how many adult equivalents each household contained. We can generate a file with this information using data from the member file, C-Q1A.SAV.
3. We need to get the results from steps 1 and 2 together in a single file in order to compute calories produced per adult equivalent per day.

Step 1: Generate a household level file containing the number of calories produced per household.

In executing this step, we must keep three things firmly in mind.

First, all production is currently measured in non-standard units whose weight is different for each product. Thus, we must first convert all production into kilograms.

Second, we want to know calories produced by each household, not kilograms. Thus, after converting all production to kilograms, we must convert it again to calories.

Third, an examination of Table IV shows that we have data for each product produced by the household. But we want to know the total calories produced by the household, not the total calories from each separate product. Thus, after converting all production to calories, we must, for each household, sum the calories from each product to arrive at the household total.

With these points firmly in mind, let's begin by opening C-Q4.SAV.

1. Select **File/Open...**
2. Select the file name c-q4.sav
3. Paste and run the command.

We are only interested in the seven staple food crops (corn, nhemba bean, manteiga bean, manioc, rice, sorghum, and peanuts). Looking at **prod** in the questionnaire, we find that these products have codes of 47, 30, 31, 41, 6, 44 and 5. To make only these cases active we use **Select Cases**. **Select Cases** selects a subset of the cases based on particular criteria. **Select Cases** can either filter out the unselected cases or delete the unselected cases. If you delete the unselected cases you can return to the original file as long as you do not save the current working file under the same name as the original file. If you filter out the unselected cases (which we will be doing since it is a safer method) you can always unfilter the data which will activate all of the cases in the file.

1. From the **Data** menu select **Select Cases...**
   You should see the Select Cases *dialog box.*
2. Select the radio button next to If condition is satisfied

3. Click on **If...** under If condition is satisfied
4. Click **in** the box, to the right of ▶, **not** on the button itself .
5. Enter the following text (without returns):

    ```
    PROD = 47 | PROD = 30 | PROD = 31 | PROD = 41 | PROD = 6 |
    PROD = 44 | PROD = 5
    ```

    The "|" are symbols for the word OR. We are telling SPSS to select all cases with **prod** *equal to 47 or 30 or 31...*
6. Click on **Continue**
7. Select the radio button next to Filtered
8. Paste the command
9. Select the text in the Syntax Editor from `USE ALL` to `EXECUTE` and run the command.

Only cases with these product codes will now be used. This subset of the data will be in effect until we open another file or Select All cases (unfilter the cases).

Let's first convert all production of these seven crops into kilograms. To find the conversion factor appropriate for each case in the production file(C-Q4.SAV), we need to look up the product and unit in the CONVER.SAV file. We will create a new file where each case has both the data from the production file and a variable containing the conversion factor for that product-unit combination. In SPSS for Windows, the command to do this is **Merge Files**/**Add Variables**.

The input files for a merge must be sorted by the key variable(s) (those variables you are using to match the cases). Since we have a unique conversion factor for each product-unit combination, both our product variable and our unit variable are key variables. The CONVER.SAV file is already sorted by **prod** and **unit**. We must sort the currently working production file the same way, while taking account of the fact that the unit variable is named **p1a** and not **unit**.

1. From the **Data** menu select **Sort Cases...**

    The Sort Cases *dialog box will come up.*
2. Select **prod** and click on ▶
3. Select **p1a** and click on ▶
4. Paste and run the command.

The files are now ready to be merged. **Merge Files** requires at least two files as input. In this case, the two files are CONVER.SAV and the working data file. The file created by **Merge Files** will become the working data file, replacing the current one.

1. From the **Data** menu select **Merge Files**, then select **Add Variables...**

    The Add Variables: Read File *dialog box will come up.*
2. Select the filename conver.sav
3. Click on **Open**
4. Select **p1a** from the list under New Working Data File: and click on ◀
5. Click on **Rename...**

    This will allow you to rename **p1a** *to* **unit** *to match the conversion file.*
6. Next to New Name: type **unit**
7. Click on **Continue**

8. Check the box next to Match cases on key variables in sorted files
9. Click on radio button next to External file is keyed table
10. Select **prod** from the Excluded Variables: list
11. Click on ▶ next to Key Variables: (bottom, right)
12. Repeat steps 10 and 11 for **unit**
13. Paste the command
    A warning will come up telling you the data files must be sorted. Since we have sorted the files...
14. Click on **OK**
    A dialog box will ask you if you want to save the contents of the data *window. We do not want to save it, the new file can take its place, so...*
15. Click on **NO**
16. Select and run the command. Be sure to include `EXECUTE`.

The above steps tell SPSS for Windows to merge the working data file and the CONVER.SAV file, (using CONVER.SAV as a table lookup) to add the unit variable to our working data file. Since the key variables need to have the same names in both files we rename **p1a** (the unit variable for our working file) to **unit** (**p1a** will remain **p1a** in c-q4.sav).

Key Variables are required in any Merge when one of the files is being used as a keyed table. Our key variables specify doing the lookup by product and unit, because we have a different conversion factor for each product-unit combination. If we had used only **prod**, SPSS would expect each product to have only a single conversion factor, with the same value regardless of the unit of measurement used. For example, it would expect the same conversion factor for rice whether it was in a 100 kg bag or a 20 liter can. This would be incorrect.

The new working file produced by the merge now contains the needed conversion factor variable, **conver**. For every product-unit combination, **conver** is equal to the number of kilograms in that unit. We can now calculate total kilograms by multiplying the number of units (**p1b**) by this conversion factor.

1. From the **Transform** menu select **Compute...**
2. Under Target Variable: enter **qprod_tt** (for total quantity of production in kg)
3. Label **qprod_tt** here, if you wish.
4. From the list on the left select **p1b** and click on ▶
5. Type * or select the button in the dialog box
6. From the list on the left select **conver** and click on ▶
7. Paste, select and run the command

Next, we need to look up how many calories per kilogram each product contains. This information is in the table-lookup file CALORIES.SAV. This file has two variables—product and number of calories per kilogram. The key variable is product. In order to add the calorie-conversion variable to the working data file we need to do another merge with keyed table lookup. This time the key variable only needs to be the product variable. The data file has already been sorted by product (see the previous merge), so we don't need to sort it again.

1. From the **Data** menu select **Merge Files** then **Add Variables...**
2. Select the file calories.sav, **Open**
3. Check the Match cases... box
4. Check the External file is keyed table box
5. Put **prod** in the Key Variables: box
6. Paste the command
7. Clear the warnings as necessary
8. Select and run the command

The new working data file produced by the merge now contains the needed calorie variable, **calories**. We can now compute total calories produced.

1. Use **Transform**/**Compute...**
2. Use **kprod_tt** as the Target Variable: (for total calories produced)
3. Click in the Numeric Expression box and enter this equation **qprod_tt * calories**
4. Paste, select and run the command

This gives us a working data file with total calories produced per product for each household. Now, we need to know how many calories were produced per household for all staple food products combined. To do this, we need to sum, for each household, the values of **kprod_tt** for all of the food crops the household produced. In other words, we need to create a new household-level file from the current product-level file with one case per household.

To create the new household-level file, we use **Aggregate**. **Aggregate** will create a new data file with one case per household and **kprod_tt** summed for each. It always uses the working data file as the file to be aggregated. We already have the production file open, so we're ready to aggregate.

1. From the **Data** menu select **Aggregate...**
   The Aggregate Data *window will appear.*
2. Select **district**, **vil**, and **hh,** respectively, for the Break Variable(s):
3. Select **kprod_tt** as the Aggregate Variable(s):
4. Click on **Name & Label...**
5. Change the default name **kprod__1** to **kprod_tt**
6. Enter the following label: Calories Produced in Staple Foods
7. Click on **Continue**
8. Click on **Function...**
9. Select Sum of values and click on **Continue**
10. Select Replace working data file
11. Paste the command
12. Click on **No** to not save the contents of data window NewData
13. Run the command.

If we had selected Create new data file instead of Replace working data file, the new aggregated data file would have been stored on disk, and would not have become our working file. We would have had to open the file to access it.

The Break Variable(s) specify the variables to be used for combining cases in the aggregated file. Any cases from the original file that have identical values for all of the break variables will be combined into a single case in the aggregated file. We want the aggregated file to have one case per household, so we use the variables that identify a household in our survey—**district**, **vil**, and **hh**.

Aggregate Variable(s) creates a new variable **kprod_tt**, which we calculate by summing **kprod_tt**, total calories produced, across all cases (the different food crops) for each household. The only variables which are contained in an aggregated file are the break variables and any new aggregated variables created (e.g. **kprod_tt**).

The new working data file now contains what we need, total number of calories produced per household. To be sure this new variable exists, do a **Descriptives** on **kprod_tt**. You should find that the average number of calories produced per household per year is 4,483,964.7.

Save this data file using the **Save As...** command.

1. Make the Data Editor window active.
2. Use **Save As...** from the **File** menu
3. Name the file hh-file1
4. Paste and run the command.

Step 2: Generate a household level file containing the number of adult equivalents per household.

The data needed to calculate adult equivalents per household is in the member file, C-Q1A.SAV.

1. Click on the open folder button on the SPSS Data Editor Taskbar
2. Select the file name c-q1a.sav
3. Paste and run the command.

The rules we will use for calculating adult equivalents for this survey are:

Males, 10 years and older	= 1.0
Females, 10 to 19 years old	= 0.84
Females, 20 years and older	= 0.72
Children, under 10 years old	= 0.60

This says that, on average, a female 10 to 19 years old needs only 84% as many calories as a male 10 years or older, and that children under 10 need only 60% as many calories as the typical male older than 10. Thus for example, a child (male or female) under age 10 gets counted as .60 adult equivalents. For each person (case) in the member file we need to look at their sex, **ca4**, and their age, **ca3**, to calculate their adult equivalent.

Compute.../If... allows us to do this. The adult equivalent variable being created is **ae**.

1. From the **Transform** menu select **Compute...**
   The Compute Variable *window will appear.*
2. For the Target Variable: enter **ae**
3. In the Numeric Expression: box enter a **1**
4. Click on **If...**
5. Select the radio button for Include if case satisfies condition:
6. Enter the statement **ca4 = 1 & ca3 >= 10**
7. Click on **Continue**
8. Paste the command but don't run it yet.
9. Repeat steps 1, and 3-8 replacing the previous information with the following. You are not obliged to use the menus within SPSS. Once you have a set of commands that you have pasted to the Syntax editor, it becomes much easier at this stage to simply copy and paste the same command within the Syntax editor itself and then changing the variables names. It is quicker. For those who cannot perform the copy/paste manoeuver here within the Syntax editor, simply repeat the steps above as indicated.

Numeric Expression	If... Statement
.84	**ca4 = 2 & ca3 >= 10 & ca3 <= 19**
.72	**ca4 = 2 & ca3 >= 20**
.60	**ca3 < 10**

10. Select all of the `If` statements and run.

To verify that the new adult equivalent variable, **ae**, has been calculated, display a frequency table for it.

1. You will need to select **Statistics**/**Summarize**/**Frequencies...**
2. Use **ae**
3. Paste and run

You should see there are 1524 total cases. Ideally there should be four values represented in the table —1, .72, .84, and .60— and no missing cases. You can see we have nine missing cases. This tells us that our data file is missing either the age or the sex for nine people. This is something that should have been identified during the cleaning process. At this point a researcher should go back to the original questionnaires and try to fix this. Since we can't do this, we will use an alternative method.

If we leave these values missing, the sizes of our households will appear to be slightly smaller than they actually are, which will distort our results. We could avoid this problem by eliminating the households of those nine individuals from our analysis, but then we can't use the information about the food production from those households. Instead, we will try to make a reasonable assumption about those nine missing members. We know that the adult-equivalent values range from a low of .6 for children to a high of 1.0 for adult males, which is not a very wide range. To find out the average adult-equivalent value for our sample...

1. **Statistics**/**Sumarize**/**Descriptives...**
2. Variable is **ae**
3. Don’t forget to paste before you run the command

This shows that the mean value of **ae** for all individuals is .79, with a standard deviation of only .17. We will assume that the nine individuals with missing age or sex codes are all "average" individuals, and assign them the adult-equivalent value of .79. (Warning: be very cautious about "filling in" missing data this way, because careless use of this technique can give you misleading results. We are using this as an illustration of SPSS commands, not recommending that you do this routinely to compensate for missing data.)

1. **Transform**/**Recode**/**Into Same Variables...**
   Recode into Same Variables *dialog box will appear.*
2. Move **ae** to Variables:
3. Click on **Old and New Values...**
4. Select System-missing
5. Select Value: in the New Value section and enter **.79** in the box
6. Click on **Add**
7. **Continue**
8. Paste, select and run

Now we need to calculate the number of adult equivalents for each household. The current file is at the member level, but the values we need are for the household level. Again we use **Aggregate** to go from the member level to the household level. The new variable **ae_tt** will be calculated by summing **ae** across all members of a household.

1. From the **Data** menu select **Aggregate...**
2. Move **district**, **vil**, and **hh** to Break Variable(s):
3. Move **ae** to Aggregate Variable(s):
4. Click on **Name & Label...**
5. In the Name: box enter **ae_tt**
6. In the Label: box enter **Adult Equivalents**
7. **Continue**
8. **Function...**
9. Select Sum of values
10. **Continue**
11. Select Replace working data file
12. Paste, clear warnings and run.

Aggregate creates a new working file. The new working data file is at the household level, with one case per household. The variable **ae_tt** is the total adult equivalents for that household.

To verify that this variable was created, do a **Descriptives** on **ae_tt**.

1. **Statistics**/**Sumarize**/**Descriptives**...
2. Paste and run.

You should find that the average adult equivalent over all households is 3.49.

This completes step 2. Save this file as HH-FILE2.SAV.

1. Make sure Data Editor window is active
2. **File/Save As...**
3. Filename hh-file2
4. Paste and run.

Step 3: We need to join the two files created in steps 1 & 2 together in order to compute calories produced per adult equivalent.

Now we have HH-FILE1.SAV containing the calorie-production data for all households, and we have HH-FILE2.SAV containing the adult-equivalent data for all households. We need to combine these files case-by-case to get both sets of data in a single file. To do this, we use **Merge Files**, but this time neither of the files are keyed tables.

We noted earlier that key variables are required for any merge that includes a keyed table lookup. When you're joining two files at the same level, as we're about to do, it may not seem important to include key variables, but it is. The key variables determine which cases are to be combined. *You should never use **Merge Files** without Key Variables because without them you have no guarantee that SPSS will combine the right cases.* The command will execute without any warnings or error messages, but the results may be incorrect.

Note: hh-file2.sav is still the working file

1. **Data/Merge Files/Add Variables...**
2. Use file hh-file1.sav for the Read File
3. **Open**
4. Select Match cases on key variables...
5. Select Both files provide cases
6. Key Variables: are **district**, **vil**, and **hh** respectively
7. Paste, clear warning, select and run.

Merge Files created a new working data file. The two variables you need in order to compute calories produced per adult equivalent are now in the working file. Total calories produced (**kprod_tt**) per household for the year divided by total adult equivalents per household (**ae_tt**) divided by 365 days per year gives us calories produced per adult equivalent per day (**kprod_ae**).

1. **Transform/Compute...**
2. Target Variable: **kprod_ae**
3. **Type & Label...**
4. Label: **Calories produced per adult equivalent**
5. **Continue**
6. Numeric Expression: enter **kprod_tt/ae_tt/365**
7. Paste, select and run

Before we can produce the table we want, we have to create one more variable, denoting which calorie-production quartile each household falls in within their district. **Rank Cases** can do this for us. **Rank Cases** computes a new variable for each case, showing how that case ranks within a group according to the value of another variable. In this case, we want to classify each household by how it ranks within its district in terms of calories produced per **ae**. Specifically, for each district, we want to break the households into four groups of equal size (quartiles), from lowest to highest calorie production. A new variable containing values from 1 to 4 will indicate to which quartile each household belongs.

1. **Transform**/**Rank Cases...**
2. Move **kprod_ae** to Variable(s):
3. Move **district** to By:
4. **Rank Types...**
5. Unselect Rank
6. Select Ntiles: 4
7. **Continue**
8. Paste and run
9. Note the new variable name in the Output navigator; it should be NKPROD_A

The first thing we specify is the variable containing the values to use for the ranking—in this case **kprod_ae**. Then we need the By variable to specify the variable(s) that define the groups—in this case **district**. **Rank Cases** has a number of different methods of ranking. We're using one of the simplest—/NTILES(4) tells SPSS for Windows to break the variable into quartiles. From this command SPSS for Windows will create a new variable and generate a name for it, that will contain the rankings.

We can now use **Means** to get the numbers to fill in our table.

1. **Statistics**/**Compare Means**/**Means...**
2. Move **kprod_ae** to Dependent List:
3. Move **nkprod_a** to Independent list: layer 1 of 1
   nkprod_a *came from the* **Rank Cases** *procedure.*
4. **Next**
5. Move **district** to Independent List: layer 2 of 2
6. Paste and run

You should note that mean for the entire population is 4014.5183 and the mean for the 2nd quartile in Ribaue is 2517.4551. The output from **Compare Means** gives you the numbers necessary for the table, although they are not formatted exactly as we showed the table at the beginning of this section. In Section 3 you will learn how to produce the same results but in a nicer-looking table format.

Save this file as HH-FILE3.SAV.

1. Make the Data Editor window active
2. **File**/**Save As...**
3. Filename is hh-file3
4. Paste and run

You should now save the contents of the Syntax Editor to a permanent command file for later use.

1. Make the Syntax Editor active
2. **File/Save As...**
3. Use the filename session2
   The .sps extension will be added automatically.

This file now contains all the commands from the Syntax Editor. *Whenever you do any substantial amount of work, you should always save the contents of the Syntax Editor to a command file.* You may have noticed that throughout the Sample Session we could have run the commands and by clicking on **OK** instead of **Paste**. Pasting commands into the Syntax Editor and then running them, rather than running them directly, gives you documentation on your work and enables you to run the exact same analysis over again at a future date. Documenting now can save many steps later. For example, if you find out that some data was entered incorrectly, you can change the data and then easily run an entire analysis over again on the corrected data, using the saved syntax file, without recreating the steps.

So now let's see how you would retrieve the command file you just created. To exit SPSS for Windows:

1. **File/Exit SPSS**
   SPSS will prompt you to save the contents of the windows that have not been saved; in this case the Output *window.*
2. Save the Output Navigator as session2

Start SPSS for Windows again. To open our command file:

1. **File/Open...**
2. Select Syntax(*.sps) in the Files of type: scroll down menu, then select session2.sps
3. **OK**
   The Syntax *window* !c:\sample\session2.sps *will be active*

You can then re-execute these same commands or edit them as you wish.

Your SESSION2.SPS should look similar to this:

```
GET
  FILE='C:\SAMPLE\C-Q4.SAV'.
EXECUTE .
USE ALL.
COMPUTE filter_$=(prod=47 or prod=30 or prod=31 or prod=41 or prod=6 or
  prod=44 or prod=5).
VARIABLE LABEL filter_$ 'prod=47 or prod=30 or prod=31 or prod=41 or prod=6'+
 ' or prod=44 or prod=5 (FILTER)'.
VALUE LABELS filter_$  0 'Not Selected' 1 'Selected'.
FORMAT filter_$ (f1.0).
FILTER BY filter_$.
EXECUTE .
SORT CASES BY
  prod (A) p1a (A) .
MATCH FILES /FILE=*
 /RENAME  p1a=unit
 /TABLE='C:\SAMPLE\CONVER.SAV'
 /BY prod unit.
EXECUTE.
COMPUTE qprod_tt = p1b * conver .
EXECUTE .
MATCH FILES /FILE=*
 /TABLE='C:\SAMPLE\CALORIES.SAV'
 /BY prod.
EXECUTE.
COMPUTE kprod_tt = qprod_tt * calories .
EXECUTE .
AGGREGATE
  /OUTFILE=*
  /BREAK=district vil hh
  /kprod_tt 'Calories Produced in Staple Foods' = SUM(kprod_tt).
DESCRIPTIVES
  VARIABLES=kprod_tt
  /FORMAT=LABELS NOINDEX
  /STATISTICS=MEAN STDDEV MIN MAX
  /SORT=MEAN (A) .
SAVE OUTFILE='C:\SAMPLE\HH-FILE1.SAV'
   /COMPRESSED.
GET
  FILE='C:\SAMPLE-Q1A.SAV'.
EXECUTE .
IF (ca4 = 1 & ca3 >= 10) ae = 1 .
EXECUTE .
IF (ca4 = 2 & ca3 >= 10 & ca3 <= 19) ae = .84 .
EXECUTE .
IF (ca4 = 2 & ca3 >=20) ae = .72 .
EXECUTE .
IF (ca3 < 10) ae = .60 .
EXECUTE .
FREQUENCIES
  VARIABLES=ae  .
DESCRIPTIVES
  VARIABLES=ae
  /FORMAT=LABELS NOINDEX
  /STATISTICS=MEAN STDDEV MIN MAX
  /SORT=MEAN (A) .
RECODE
  ae  (SYSMIS=.79)  .
EXECUTE .
AGGREGATE
  /OUTFILE=*
  /BREAK=district vil hh
  /ae_tt 'Adult Equivalents' = SUM(ae).
DESCRIPTIVES
  VARIABLES=ae_tt
  /FORMAT=LABELS NOINDEX
  /STATISTICS=MEAN STDDEV MIN MAX
  /SORT=MEAN (A) .
SAVE OUTFILE='C:\SAMPLE\HH-FILE2.SAV'
   /COMPRESSED.
MATCH FILES /FILE=*
 /FILE='C:\SAMPLE\HH-FILE1.SAV'
 /BY district vil hh.
EXECUTE.
COMPUTE kprod_ae = kprod_tt/ae_tt/365 .
VARIABLE LABELS kprod_ae 'Calories produced per adult equivalent' .
EXECUTE .
RANK
  VARIABLES=kprod_ae  (A) BY district  /NTILES (4) /PRINT=YES
  /TIES=MEAN .
MEANS
  TABLES=kprod_ae  BY nkprod_a  BY district
  /CELLS MEAN STDDEV COUNT
  /FORMAT= LABELS .
SAVE OUTFILE='C:\SAMPLE\HH-FILE3.SAV'
   /COMPRESSED.
```

<u>Exercise 2.1</u>: Produce similar output using calories retained (production minus sales) instead of calories produced. It will show calories retained per adult equivalent per day from the total of the same six food crops. The output should be broken down by district and calorie production quartile.

Hints:

a. The procedure is very similar to the work that we just completed.

b. Sales come from c-q5.sav.

c. Check the file for the appropriate variable for the quantity of sold production. Note that the product codes are the same as for c-q4.sav. Also check for the variables by which to sort.

d. Retrieve the commands from generating the previous table and check each step for needed changes. There will be changes of product code, file names, and variables.

e. Computing the calories sold involves the same basic steps as computing the calories produced. (Step 1)

f. Merge this newly created file, (the file containing calories sold), with the file containing calories produced, hh-file3.sav.

g. Keep in mind that only 256 households sold products, but all 343 households produced and retained calories. If the calories-sold variable is missing, it means the household did not produce food, so it should be recoded to zero.

h. Compute calories retained = calories produced - calories sold.

i. Rank into quartiles.

j. Use the **Compare Means** command to show calories retained by **district** and **quartile**.

k. Save the data file.

l. There's no need to save the contents of the Syntax Editor, from the exercise, to a file.

m. Execute the newly created syntax file, select all and run

This is an example of the output you should produce:

```
                 - - Description of Subpopulations - -

Summaries of     KRET_AE    Calories Retained per adult equivalent
By levels of     NKRET_AE   NTILES of KRET_AE by DISTRICT
                 DISTRICT   DISTRICT


Variable        Value  Label                      Mean    Std Dev    Cases

For Entire Population                        3044.2336  2370.1465      343

NKRET_AE            1                        1098.8770   401.0378       84
  DISTRICT          1  MONAPO                1148.0448   409.6144       27
  DISTRICT          2  RIBAUE                1232.8030   350.2260       29
  DISTRICT          3  ANGOCHE                912.7559   384.7468       28

NKRET_AE            2                        2015.5753   297.9913       86
  DISTRICT          1  MONAPO                2211.3833   205.7199       27
  DISTRICT          2  RIBAUE                2145.8446   202.8158       30
  DISTRICT          3  ANGOCHE               1698.5099   168.4997       29

NKRET_AE            3                        2946.5741   547.1454       87
  DISTRICT          1  MONAPO                3314.8568   477.1234       28
  DISTRICT          2  RIBAUE                3126.3578   329.8936       30
  DISTRICT          3  ANGOCHE               2405.0077   336.4856       29

NKRET_AE            4                        6071.8027  2821.2709       86
  DISTRICT          1  MONAPO                7619.1018  3557.1354       27
  DISTRICT          2  RIBAUE                5759.0391  1649.5839       30
  DISTRICT          3  ANGOCHE               4954.7625  2426.8245       29

  Total Cases = 343
```

SPSS for Windows SAMPLE SESSION
SECTION 3 - Tables & Multiple Response Questions

Short Course Training Materials
Designing Policy Relevant Research and
Data Processing and Analysis with SPSS for Windows 7.5
3rd Edition

Department of Agricultural Economics, Michigan State University
East Lansing, Michigan
February 1999

Tables

Using **Tables** you can calculate various statistics and present them in a variety of ways that are completely under your control. Unlike other SPSS for Windows procedures, **Tables** allows you to do the following:

- to choose how you want to assemble variables and statistics for display in rows, columns, layers, nestings, and/or concatenations.
- to manipulate table structure, content, and presentation format.
- to present multiple tables in the same display (concatenate) and to nest multiple subtables in any dimension.
- to include flexible percentages, specifying the base for the percentages (their denominator) so that they add to 100% across rows, columns, subtables, or whole tables.
- display up to 60 characters for variable labels and value labels.

Let's compare crosstabulation using the **Crosstabs** procedure to using the **Tables** procedure.

Open the member file we created that contains the age variable, Q1A-AGE.SAV.

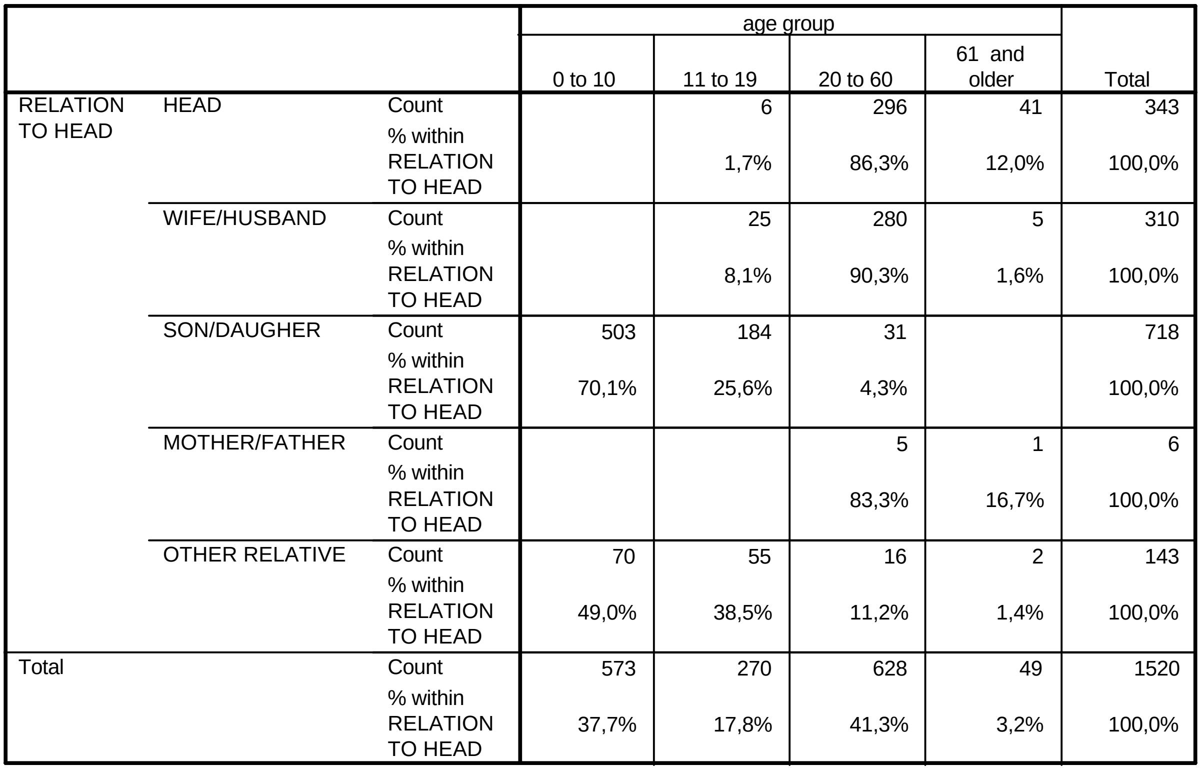
1. **File**/**Open...**
2. Select q1a-age.sav
3. Paste, select and run.

First do a simple crosstabulation using the **Crosstabs**.

1. **Statistics**/**Summarize**/**Crosstabs...**
2. Move **ca2** to Row(s):
3. Move **age** to Column(s):
4. **Cells...**
5. Select Observed in the Counts section
6. Select Row in the Percentages
7. **Continue**
8. Paste and run

It produces the following table:

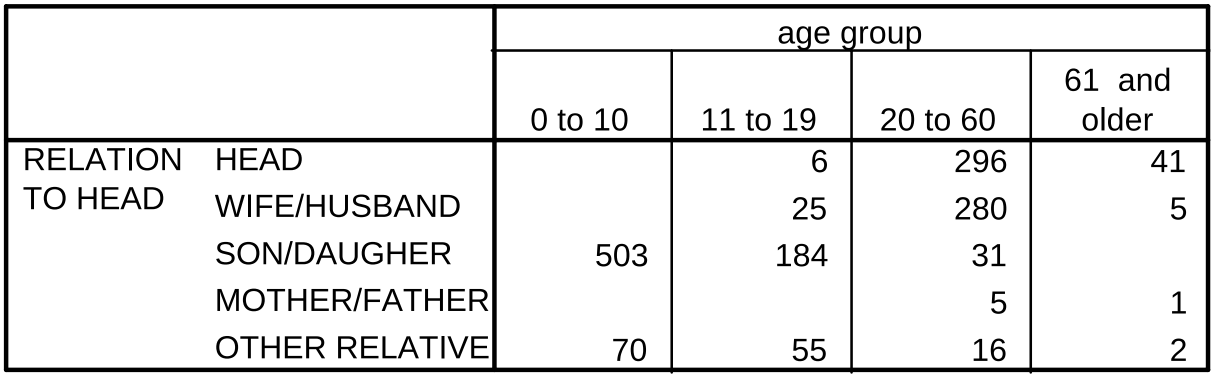
RELATION TO HEAD * age group Crosstabulation



			age group				
			0 to 10	11 to 19	20 to 60	61 and older	Total
RELATION TO HEAD	HEAD	Count		6	296	41	343
		% within RELATION TO HEAD		1,7%	86,3%	12,0%	100,0%
	WIFE/HUSBAND	Count		25	280	5	310
		% within RELATION TO HEAD		8,1%	90,3%	1,6%	100,0%
	SON/DAUGHER	Count	503	184	31		718
		% within RELATION TO HEAD	70,1%	25,6%	4,3%		100,0%
	MOTHER/FATHER	Count			5	1	6
		% within RELATION TO HEAD			83,3%	16,7%	100,0%
	OTHER RELATIVE	Count	70	55	16	2	143
		% within RELATION TO HEAD	49,0%	38,5%	11,2%	1,4%	100,0%
Total		Count	573	270	628	49	1520
		% within RELATION TO HEAD	37,7%	17,8%	41,3%	3,2%	100,0%

Produce a similar type of crosstabulation table using **Basic Tables**.

1. **Statistics**/**Custom Tables**/**Basic Tables...**
2. Move **ca2** to Down:
3. Move **age** to Across:
4. Paste and run.



		age group			
		0 to 10	11 to 19	20 to 60	61 and older
RELATION TO HEAD	HEAD		6	296	41
	WIFE/HUSBAND		25	280	5
	SON/DAUGHER	503	184	31	
	MOTHER/FATHER			5	1
	OTHER RELATIVE	70	55	16	2

This is a **Basic Table**, using its default settings. The row labels correspond to the value labels for variable **ca2**. The column labels are the value labels which you designated for the variable **age**. If you want to customize the table for your needs, **Basic Tables** can become much more complex. For an example of a more complex table...

Modifying label

1. Select **ca2** in the Data Editor
2. **Data/Define Variable...**
3. **Labels...**
4. Delete the text in the Variable Label: box

This will blank out the label for **ca2** *so it will not appear in the first column.*

5. **Continue**
6. **OK**

Creating table

7. **Statistics/Custom Tables/General Tables...**
8. Move **ca2** to Rows:
9. Move **age** to Columns:
10. Select **age**, click on **Edit Statistics...**

Modifying statistics

11. Select **Count** under Cell Statistics:
12. Change Label: to **N**
13. Change Width: to **5**
14. **Change**
15. Select Count Row % from under Statistics:
16. Change the Label: to **%**
17. Change the Width: to **5**
18. **Add**
19. **Continue**

Adding Total

20. **Insert Total**
21. Select ageTotal, click on **Edit Statistics...**
22. Select the radio button next to Custom Total Statistics
23. Select **Count** under Statistics:
24. Change Label: to **N**
25. Change Width: to **5**
26. **Add**
27. **Continue**
28. Select **ca2**, click on **Insert Total**

Modifying format

29. **Format...**
30. Set Empty Cell Appearance to Zero
31. **Continue**

Adding title

32. **Titles...**
33. In the Title box:
34. Type **Table 1: SPSS for Windows Sample Session**
35. Type **Age breakdown by Relation to Head**
36. Type **Source: Nampula family sector household survey, 1991**.
37. In the Corner box: type **Relation to Head**
38. **Continue**
39. Paste and run

This is the table produced from those commands:

Table 1: SPSS for Windows Sample Session
Age breakdown by relation to Head
Source: Nampula family sector hh survey, 1991.

		age group								Total
		0 to 10		11 to 19		20 to 60		61 and older		
		N	%	N	%	N	%	N	%	N
RELATION TO HEAD	HEAD	0	,0%	6	1,7%	296	86,3%	41	12,0%	343
	WIFE/HUSBAND	0	,0%	25	8,1%	280	90,3%	5	1,6%	310
	SON/DAUGHER	503	70,1%	184	25,6%	31	4,3%	0	,0%	718
	MOTHER/FATHER	0	,0%	0	,0%	5	83,3%	1	16,7%	6
	OTHER RELATIVE	70	49,0%	55	38,5%	16	11,2%	2	1,4%	143
Total		573	37,7%	270	17,8%	628	41,3%	49	3,2%	1520

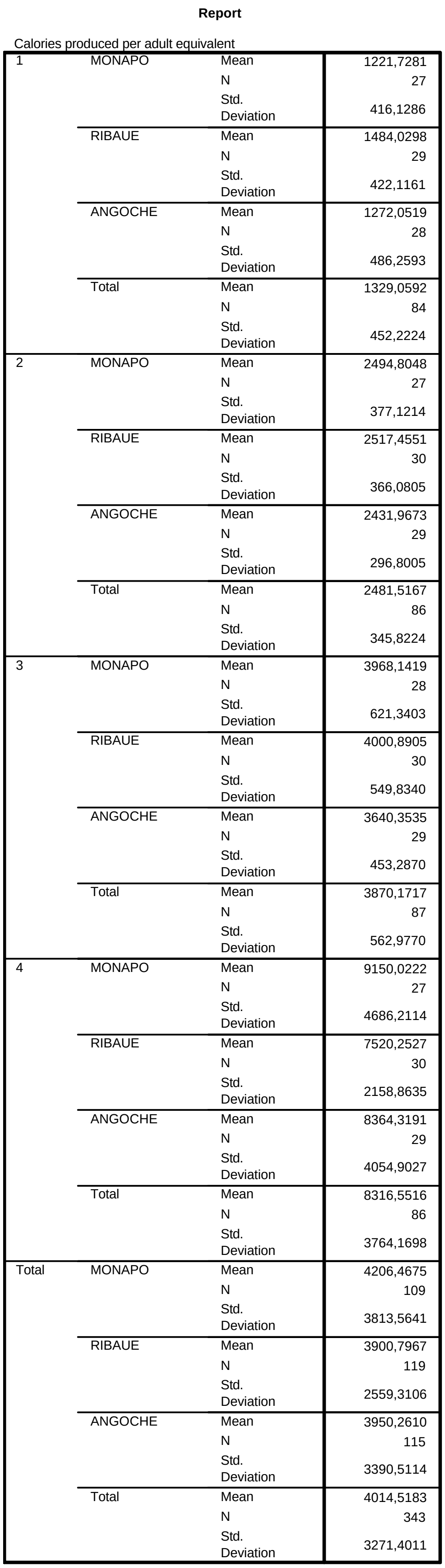
Note: You may change the table properties, formats, pivot the tables, etc.

This may seem like a lot of effort to produce a single table. For a one-time application it may seem easier to create the table in a word processor. However, if this is something you are going to do repeatedly, the benefits of having SPSS for Windows produce the "pretty" table far outweigh the effort to create the table. This becomes important with periodic data, such as monthly prices, where each month the table should be updated.

The following is a comparison of computing averages using **Compare Means** and using **Custom Tables**, based on an example from section 2.

1. **File**/**Open...**
2. Select hh-file3.sav
3. Paste, select and run
4. **Statistics**/**Compare Means**/**Means...**
5. Move **kprod_ae** to Dependent List:
6. Move **nkprod_a** to Independent list: layer 1 of 1
7. **Next**
8. Move **district** to Independent List: layer 2 of 2
9. Paste and run

It produces the following output (right):
This is the information we needed to fill in the numbers of our table in section 2. Let's use **Custom Tables** to produce output that looks similar to the table we were shooting for throughout section 2. Let's add the Minimum and Maximum to the table for more information.



Report

Calories produced per adult equivalent

1	MONAPO	Mean	1221,7281
		N	27
		Std. Deviation	416,1286
	RIBAUE	Mean	1484,0298
		N	29
		Std. Deviation	422,1161
	ANGOCHE	Mean	1272,0519
		N	28
		Std. Deviation	486,2593
	Total	Mean	1329,0592
		N	84
		Std. Deviation	452,2224
2	MONAPO	Mean	2494,8048
		N	27
		Std. Deviation	377,1214
	RIBAUE	Mean	2517,4551
		N	30
		Std. Deviation	366,0805
	ANGOCHE	Mean	2431,9673
		N	29
		Std. Deviation	296,8005
	Total	Mean	2481,5167
		N	86
		Std. Deviation	345,8224
3	MONAPO	Mean	3968,1419
		N	28
		Std. Deviation	621,3403
	RIBAUE	Mean	4000,8905
		N	30
		Std. Deviation	549,8340
	ANGOCHE	Mean	3640,3535
		N	29
		Std. Deviation	453,2870
	Total	Mean	3870,1717
		N	87
		Std. Deviation	562,9770
4	MONAPO	Mean	9150,0222
		N	27
		Std. Deviation	4686,2114
	RIBAUE	Mean	7520,2527
		N	30
		Std. Deviation	2158,8635
	ANGOCHE	Mean	8364,3191
		N	29
		Std. Deviation	4054,9027
	Total	Mean	8316,5516
		N	86
		Std. Deviation	3764,1698
Total	MONAPO	Mean	4206,4675
		N	109
		Std. Deviation	3813,5641
	RIBAUE	Mean	3900,7967
		N	119
		Std. Deviation	2559,3106
	ANGOCHE	Mean	3950,2610
		N	115
		Std. Deviation	3390,5114
	Total	Mean	4014,5183
		N	343
		Std. Deviation	3271,4011

1. Change the labels for the following Variables by selecting the variable in the Data Editor and using **Data/Define Variables/Labels...**

Variable	New Label
kprod_ae	delete label
district	**District**
nkprod_a	delete label

2. **Statistics/Custom Tables/Basic Tables...**
3. Move **kprod_ae** to Summaries:
4. Move **nkprod_a** to Down:
5. Move **district** to Across:
6. **Statistics...**
7. Select Mean, use the label **MEAN**, Format: **ddd.dd**, Width: **5** and Decimals: **0**
8. **Add**
9. Select Maximum, use **MAX,** Format: **ddd.dd**, Width: **5** and Decimals: **0**
10. **Add**
11. Select Minimum, use the label **MIN**, Format: **ddd.dd**, Width: **5** and Decimals: **0**
12. **Add**
13. **Continue**
14. **Layout...**
15. In the Statistic Labels section, select, Down the Left side, **Continue**
21. **Titles...**
22. Type in the Title box: **Table 1: Food Production in calories**
23. Then type right after **per adult equivalent per day**
24. Enter in the Corner box: **Production Quartile**.
25. **Continue**, paste and run

This produces the following table:

Table 1: Food Production in Calories per Adult Equivalent per Day

		District		
Production Quartile		MONAPO	RIBAUE	ANGOCHE
1	Mean	(1222)	(1484)	(1272)
	Maximum	(1956)	(1938)	(1952)
	Minimum	(294)	(429)	(354)
2	Mean	(2495)	(2517)	(2432)
	Maximum	(3169)	(3120)	(2961)
	Minimum	(1973)	(2030)	(2024)
3	Mean	(3968)	(4001)	(3640)
	Maximum	(5067)	(4834)	(4563)
	Minimum	(3176)	(3141)	(2996)
4	Mean	(9150)	(7520)	(8364)
	Maximum	(28466)	(13124)	(20485)
	Minimum	(5107)	(4984)	(4692)

Some of you might not have the **Production Quartile** showing in the Corner box. You need to have the Corner box "Nested" which you can do through the *Pivot Table Editor*. Select the table by double-clicking on it in the Output Editor. Right-click on the same table and select **Table Properties...** in the pop-up menu. Select the ***Nested*** Radio button in the *Row Dimension Labels* box. Click on OK. And then click outside the table to resume your work in the SPSS Output Editor. You should now see the title in the corner box.

Summaries specifies which variables are continuous. This is usually the most important variable, one for which the statistics will be computed. In the above example the variable **kprod_ae** is a continuous variable for which minimums, means, and maximums are calculated for each category of **nkprod_a.**

Subgroups determines how to group the cases into rows and columns of the table. Variables named in Subgroups should always be category variables (variables that have a finite number of values). **Statistics** indicates what statistics should be computed using the continuous (Summaries) variables.

If SPSS for Windows reports an error for a **Custom Table** it usually has to do with using an incorrect variable for the requested function or variable width being too large for the table. If the table is obviously wrong from the first screen, use <F3> to stop further processing. If you get one of these errors check to be sure that you listed a continuous variable under Summaries and that variable widths and column widths are adequate.

A simple way to print a table you have just created, is to select the table(s) in the **Output** Navigator and print.

1. Make the Output Navigator active
2. Select the table you wish to print
3. **File**/**Print...**/OK

<u>Exercise 3.1</u>: Produce a similarly formatted table using calories retained as you did in Exercise 2.1. **Include totals** (you will have to use **General Tables**). Your table should look similar to this:

```
               Table 1:   Food retention in calories
                    Per adult equivalent per day

________________________________________________________
________________________________________________________

Production Quartile          District           Total
                      ___________________________
                      MONAPO   RIBAUE  ANGOCHE
________________________________________________________

1

    MEAN                1148     1233      913     1099
    MAX                 1806     1783     1391     1806
    MIN                  224      429      208      208

2

    MEAN                2211     2146     1699     2016
    MAX                 2544     2556     1936     2556
    MIN                 1807     1790     1396     1396

3

    MEAN                3315     3126     2405     2947
    MAX                 4303     3730     3055     4303
    MIN                 2555     2566     1984     1984

4

    MEAN                7619     5759     4955     6072
    MAX                20874     9465    12675    20874
    MIN                 4360     3731     3064     3064
________________________________________________________
```

Multiple Response Question

The information sought by analysts often requires questions that allow the respondent to select multiple answers. A single SPSS for Windows variable cannot record the answers to this type of question adequately, because a variable can have only one value for each case. The solution is to record each possible response in a different variable. The responses can be analyzed separately using commands you have already seen (**Frequencies**, **Crosstabs**), but ideally we want to analyze these related variables jointly. This can be done with a special grouping feature of **Custom Tables**. SPSS for Windows allows two different grouping methods, to handle two different ways of asking this type of question.

If a survey question asks the respondent to "check all that apply" from a set of ten choices, ten variables must be used to code the responses. You would need to create a variable for each of the ten possible responses. Each variable would have a value to indicate whether the response was checked (1), or not checked (0). These variables are called *multiple dichotomy* variables. Refer to the Tables manual for more detail.

On the other hand, if the survey question asks the respondent to "list up to 4 choices" from a set of ten, four variables must be used to code the responses. The set of possible responses would be numbered from 1 to 10, and the user would enter up to four of those numbers. These values would be entered for the four variables in SPSS for Windows. These variables are called *multiple response* variables. Again refer to the Tables manual for more detail.

Question 35 of the household questionnaire is an example of a multiple response question. It asks about crops grown principally to be sold. Each household is asked to specify up to three main crops which are coded into variables **h35a**, **h35b**, and **h35c**. The crop codes are provided for five of the most common crops. The question is left open-ended, however, since a code of 6 is allowed for other crops, which are written down by name.

Because the question is open ended, more categories were added to these variables. This is something that is done after all surveys are completed. Someone manually goes through all surveys and assigns a code to each of the different crops respondents came up with for "6-other". Codes and value labels are then assigned for each crop. As you will see with the following commands, eleven different crops ended up being coded for question 35.

The best way to analyze this question is to use **Custom Tables** with Multiple Response Sets. You could use **Frequencies** on each of the variables individually, but you would then have to sum the results by hand. **Custom Tables** will calculate these summary statistics for you if you create a group variable using the Multiple Response Sets. Open the household data file.

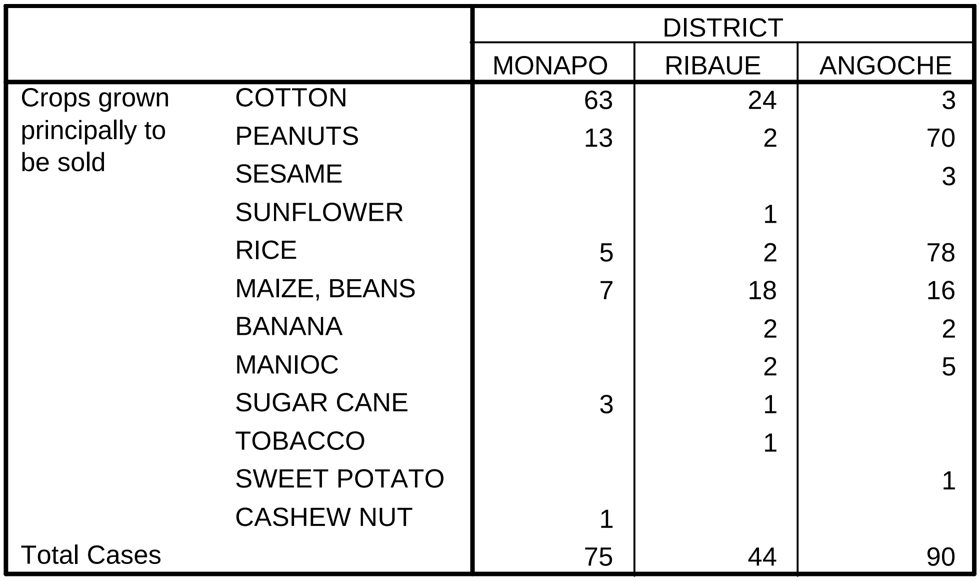
1. **File**/**Open...**
2. Select c-hh.sav
3. Paste, select and run

To create the table do the following:

1. **Statistics/Custom Tables/General Tables...**
2. **Mult Response Sets...**
3. Select **h35a**, **h35b**, **h35c** and move to Variables in Set:
4. Select Categories in the Variables Are coded As box
5. Name: **crops**
6. Label: **Crops grown principally to be sold**
7. **Add**, **Save**
8. move **$crops**, in Mult Response: to Rows:
9. Move **district** to Columns:
10. Select **$crops**
11. **Insert Total**
12. Select **$cropsTotal**
13. Change label to **Total Cases** in Total Label:
14. Paste and run.

Mult Response creates a group variable **$crops** from the three variables **h35a**, **h35b**, and **h35c**. Insert Total produces the summary statistics. As discussed in the previous section, the format for the table can be customized using the options in the Custom Table: General dialog box..

The output table should look like this:



		DISTRICT		
		MONAPO	RIBAUE	ANGOCHE
Crops grown principally to be sold	COTTON	63	24	3
	PEANUTS	13	2	70
	SESAME			3
	SUNFLOWER		1	
	RICE	5	2	78
	MAIZE, BEANS	7	18	16
	BANANA		2	2
	MANIOC		2	5
	SUGAR CANE	3	1	
	TOBACCO		1	
	SWEET POTATO			1
	CASHEW NUT	1		
Total Cases		75	44	90

SPSS for Windows SAMPLE SESSION
SECTION 4 - Graphs, tables, publications and presentations, how to bring them into word processor

Short Course Training Materials
Designing Policy Relevant Research and
Data Processing and Analysis with SPSS for Windows 7.5
3rd Edition

Department of Agricultural Economics, Michigan State University
East Lansing, Michigan
February 1999

The objective of this module is to give you the tools necessary to prepare reports, i.e. to learn how to move SPSS results into other applications. While it is possible to move SPSS text output, tables, charts and other graphics, into word processors and spreadsheets under Windows and DOS, this module will uniquely focus on a chart or table as an example. The methods used in this example would be quite similar for other SPSS results.

This module will not look at how to prepare presentations or publications. An additional module should be developed to look at these questions more precisely and should include such concepts as titles, text boxes, image insertion and watermarks among other basic concepts. Nonetheless, the tools presented in this module, showing how to transfer SPSS results to a word processor, is paramount and key to diffusing and disseminating reports and results in a presentable manner.

The method is simple: once the SPSS results such as a chart or a table are produced (it is always better to save te output as well), it can be printed or incorporated into reports prepared using word processors or publishing programs. Incorporating tables and charts from SPSS can be done using a simple copy and paste procedure (the **Copy** command must be made from a Output navigator). Unfortunately, if the original chart or table file changes (say you were preparing a paper with a graph for real prices, another graph for annual changes or a table on household characteristics which include new data collected from a different survey), to update your report you must erase the old tables and paste new copies. Proceed with a simple copy and paste procedure of an SPSS table of your choice that you have saved in the SPSS cross sectional sample session sections 1 to 3.

1. Go to **File/Open...** in SPSS for Windows 7.5
2. Select any of the files in the sample folder where you saved your output from the sample session (*.spo extension - called Navigator document)
3. Click on Open

4a. To display an SPSS Output, click once to select an object. Double-click to activate an object for editing. If the object is a pivot table, you can obtain detailed help on items within the table by right-clicking on row and column labels after the table is activated. Once you have selected a table or a chart, you may double click on it (or right click and select the last option in the dialog menu - SPSS ... Object) to open the SPSS pivot table or the SPSS chart editor.

4b. When you have finished making adjustments to the table, exit the edit box to return to the Output navigator and right click on the object, select **Copy** or go to **Edit/Copy** through the menu system. Another option is to right click and select Export. Note: It is highly recommended to make all modifications to the graphs or tables within SPSS, NOT in the word processor as within the latter, the graph or table are considered a picture. Making changes to the "picture" within a word processor are allowed but drastically changes the image and does not retain the original format or layout. Unless the it is a windows metafile format (*.WMF) which will retain all the font characteristics and border styles of the items at the time you copied them.

5. Now open your word processor software if it is not already open
6. Select a spot in your document where you would like to place the graph or chart.
7. Go to the Edit menu and select either **Paste** or **Paste Special** (or if you have selected Export and saved the file to *.wmf - you need to open the file at the selected spot of your document).
8. Selecting **Paste**, the graph or table will be pasted directly on your document. Adjust the size the graph as you wish. Using **Paste Special**, a window will appear and you can select the type of paste/link you would like to set up. Look at the choices and then select Picture. Now adjust the size of your graph in your document.
9. Save your word processor document.
10. There is something you do not like on the graph or table? You would like to change the axis, the title, a column? Double click on the table in SPSS. Go to SPSS and change as you see fit any part of the table, and select **Copy**. Now return to your word processor document and see the changes you just made! You may also modify a graph or table within your word processor but this is recommended only if under a windows metafile format. Else, simply delete the graph or table in your word processor and copy over a revised version of it from SPSS like it was done above. It is recommended to make all modifications in SPSS - as the imaging and formatting possibilities within SPSS are numerous and are one of the better achievements and changes in the SPSS 7.5 version. Remember to save your changes at all times.

Exercise 4.1.

Repeat steps 1 to 12 but instead of a graph, use a bar or a pie chart. Practice making various changes to the charts and tables in SPSS and copy the output to your word processor document. Create your own sample session output notebook.

SPSS for Windows SAMPLE SESSION

Annexes

Short Course Training Materials
Designing Policy Relevant Research and
Data Processing and Analysis with SPSS for Windows 7.5
3rd Edition

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East Lansing, Michigan
February 1999

The following annexes were prepared for users of the sample session to have a brief reference guide, to explain the various functions of the SPSS commands most commonly used in the sample session, to describe the numerous options available to the user within the various menus and finally, to help manipulate results in the Output navigator.

Filters Versus Temporary Selections.

You can filter or delete cases that don't meet the selection criteria. When you set a filter from the **Select** command, unselected cases are filtered. Filtered cases remain in the data file but are excluded from analysis. SPSS creates a filter variable, FILTER_$, to indicate filter status. Selected cases have a value of 1; filtered cases have a value of 0. Filtered cases are indicated with a slash through the case (row) number in the Data Editor. To turn filtering off and include all cases in your analysis, select All cases in the **Select** command.

Another way of selecting specific data for analysis, without using solely the **Select** command, for filters or selecting out (i.e. eliminating) data, is to use the **Temporary** and **Select** command together. The **Temporary** command signals the beginning of temporary transformations that are in effect only for the following procedure. It will be in effect until the next command that reads the data. But it may include transformations like data manipulation (i.e. the transformations will apply for selecting data and for another command such as a table, graph, or regression and so on, a transformation). This command is not available through the menus so we must type it in the Syntax editor.

The Three Line Charts and Three Data in Charts Options.

The **Line Charts** command allows you to make selections that determine the type of chart you obtain, simple, multiple and drop-line. In the menu, select the icon for the chart type you want, and select the option under Data in Chart Are that best describes your data. You can see a description of the three available Data in Chart types below. A category axis on a chart is an axis that displays values individually, without necessarily arranging them to scale. (A scale axis, in contrast, displays numerical values to scale.) Bar charts, line charts, and area charts usually have one category axis and at least one scale axis. Scatterplots and histograms do not have a category axis.

The Missing Values options are available only when the new chart will display or summarize more than one variable (not including variables that define groups):

- Exclude cases listwise excludes a case from the entire chart if is has a missing value for any of the variables summarized.
- Exclude cases variable by variable excludes a case separately from each summary statistic calculated. Different chart elements may be based on different groups of cases.

Display groups defined by missing values is available only when you use a categorical variable to define groups for a new chart. If selected, each missing value for the grouping variable (including the system-missing value) will appear as a separate group in the chart. If not, cases with system-missing or user-missing values for the grouping variable are excluded from the chart. It is recommended to always uncheck this box as it is not of interest to show on a graph the missing values or sysmisses.

Simple lines

Summaries for Groups of Cases
Categories of a single variable are summarized. The y-height of the points is determined by the Line Represents option.
A single Category Axis variable.

Summaries of Separate Variables
Two or more variables are summarized. Each point represents one of the variables.
Two or more Line Represents variables.

Values of Individual Cases
A single variable is summarized. Each point represents an individual case.
A single Line Represents variable.

Multiple lines

Summaries for Groups of Cases
Categories of one variable are summarized within categories of another variable. The y-height of the points is determined by the Lines Represent option.
A Category Axis variable (Category Variable 1).
A Define Lines by variable (Category Variable 2).

Summaries of Separate Variables
Two or more variables are summarized within categories of another variable.
Two or more Lines Represent variables (Var 1, Var 2).
A Category Axis variable (Category Variable).

Values of Individual Cases
Two or more variables are summarized for each case.
Two or more Lines Represent variables (Var 1, Var 2).

Manipulating Output in SPSS for Windows 7.5.

Numerous modules could be dedicated to working with the Output navigator. One suggestion would be to follow the tutorial within SPSS to learn about the countless possibilities and options which are available to the SPSS user in the Output navigator. Your results have never looked this good! Easier and faster data exploration and to ability to drag icons in the navigator outline and content panes on the left, expand and collapse the outline - see the output you want; multi-dimensional pivot tables, swapping and hiding rows and columns, new and numerous styles for charts and tables, colors, fonts, line styles, text attributes; no loss of any custom formatting, dragging output from SPSS to a word processor (in windows metafile format); change a title directly within the output, right click for pop-up menus as shortcuts, and much more.

The object of this annex on output is to invite you to manipulate the output as much as possible. Of note, you may have trouble viewing the complete output following a SPSS command like **Frequencies** or **Tables**. It may run hundred and thousands of cases but will only show the first 50 for example. To view all of the specific output in this case, simply double click or right click on the selected output and choose Open. This will open a separate window called a pivot table. Then scroll down to see the output in whole. You may also edit the table here as well. Enjoy using the various options given to you to modify the styles, formats, colors, text attributes and so on.

I. **HOUSEHOLD CHARACTERISTICS**

Table IA: Household Characteristics

Name	**Family Member Number**	**This person works on-farm or off-farm** **1=yes** **2=no**	**Relation to Head** **1=head** **2=spouse** **3=child** **4=parent** **5=other kin** **6=other**	**Age**	**Sex** **1=m** **2=f**	**Level of Schooling** **(enter the last completed year)** **0=illiterate** **12=post-high school** **98=no formal schooling but literate**	**Marital Status** **1=monogamous** **2=polygamous** **3=single** **4=widowed** **5=divorced** **6=emigrant wife (husband out longer than six months**
	MEM	**CA1**	**CA2**	**CA3**	**CA4**	**CA5**	**CA6**
	1		Head				
	2						
	3						
	4						
	5						
	6						
	7						
	8						
	9						
	10						
	11						
	12						

IV. **PRODUCTION**

Table IV: Characteristics of Production

Product	**Quantity harvested**		**Quantity harvested in a normal year**		**Existing stocks at harvest time**		**Month in which last year's stock ran out**	**Amount to be stored from this year's harvest for consumption**		**How long will this year's stocks last?**	**Quantity reserved for seed**	
1=corn 2=beans 3=manteiga beans 4=manioc 5=rice 6=sorghum 7=cotton 8=peanuts 9=cashew nuts 10=cashew drink 11=cane drink 12=coconut 13=coconut drink others	Unit 1=sack 100 2=sack 50 3=kilo 4=liter 5=can 20	Qt	Unit 1=sack 100 2=sack 50 3=kilo 4=liter 5=can 20	Qt	Unit 1=sack 100 2=sack 50 3=kilo 4=liter 5=lata 20	Qt	(enter the month)	Unit 1=sack 100 2=sack 50 3=kilo 4=liter 5=can 20	Qt	(enter the month or "all year", if appropriate)	Unit 1=sack 100 2=sack 50 3=kilo 4=liter 5=can 20 other	Qt
PROD	**P1A**	**P1B**	**P2A**	**P2B**	**P3A**	**P3B**	**P4**	**P5A**	**P5B**	**P6**	**P7A**	**P7B**

V. AGRICULTURAL SALES

Table V: Sales of Farm Products

Sale	Crop	Quantity sold		Period of sale	Motive for sale at this time	Buyer	Locale of sale	Distance from the farm	Why sold to this buyer	Value of Sales		Who in the household is responsible for the sale
	1=corn 2=manteiga bean 3=beans 4=manioc 5=rice 6=cotton 7=peanuts 8=cashew nut 9=cashew drink 10=cocos others	Units 1=sack 100 2=sack 50 3=kilo 4=liter 5=can 20	No. of Unit	1=planting (Aug-Dec.) 2=hungry period (Jan-April) 3=this year's harvest 4=various times	1=needed money 2=buyers available 3=consumer goods available 4=attractive price	1=lojista 2=wholesaler 3=AGRICOM 4=ambulante 5=brigada 6=company	1=farmgate/ house 2=village 3=locality 4=district 5=province	(enter the kms between farmer and point of sale)	1=the only one available 2=always sell to this one 3=best price 4=transportation provided 5=carries consumer goods	meticais	Unit 1=unit price 2=total value	1=husband 2=wife
VEN	**V1**	**V2A**	**V2B**	**V3**	**V4**	**V5**	**V6**	**V7**	**V8**	**V9A**	**V9B**	**V10**
1												
2												
3												
4												
5												
6												
7												
8												
9												

N.B. Not all of the variables that appear in the printed table above are in file C-Q5.sav. Only variables VEN, V2a, V2b, V9a and V9b were kept for this exercise. The PROD variable replaces the V1 variable.