Quick Start & Self Help Manual

NCSS Statistical System for Windows

> Published by NCSS Dr. Jerry L. Hintze Kaysville, Utah August, 2001

NCSS Quick Start & Self Help Manual

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About this manual

Congratulations on your purchase of the **NCSS** statistical package! The *NCSS* statistical package offers:

- Easy data entry.
- Statistical routines that provide high quality and accuracy yet are quick and easy to learn and use.
- Straightforward procedures for creating paper printouts and file copies of both the results of the statistical analyses and graphical representations of those results.

Our goal is that with the help of this *NCSS Quick Start* booklet, you will be up and running on the system in less than one hour. Specifically, you will quickly and successfully complete the following tasks:

- Enter a small set of data into **NCSS** (that is, create a database), label the variables, and print a hard copy of your data.
- Compute descriptive statistics on the data in the database which you created. Also, run a t-test and a regression analysis on your data.
- Print copies of the descriptive statistics reports and the other reports which you generate. Also, print graphical representations of those analyses. Also, export your text and graphic material to a word processing program such as Microsoft Word or WordPerfect.

I believe you will find that this *NCSS Quick Start* booklet provides a quick, easy, efficient, and effective way for first-time **NCSS** users to get up and running. **NCSS** users needing details on how to execute particular tasks should find the self-help chapters in the second half of this booklet very useful.

I look forward to any suggestions you have to improve the usefulness of this manual and/or the **NCSS** system. Meanwhile, good computing!

Jerry Hintze, Author

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Installation

Before you install

Check system requirements

NCSS can run on any system that can run 32-bit Windows applications. This includes Windows 98, Windows ME, Windows NT 4.0, or Windows 2000. The recommended minimum system is a Pentium PC with 32 MB of memory. **NCSS** has been tested on systems with only 16 MB of memory.

NCSS takes up about 25 MB of disk space. If space is tight, you can reduce this by deleting its help (*.hlp) files. Once installed, **NCSS** requires about 5 MB of temporary disk space while it is running.

Find a home for NCSS

Before you start installing, decide on a directory where you want to install **NCSS**. By default, the setup program will install **NCSS** in the NCSS97 (or NCSS2000) directory of your C drive. You may change this during the installation, but not after, so make sure you have the required disk space on the drive you will install **NCSS** on.

What install does

When you insert the CD into your computer, it will automatically load and run the installation program *SETUP.EXE* contained in the NCSS97 directory on the CD. If you have previous installed a copy of **NCSS**, the installation program will replace all outdated files with their current versions.

This version of **NCSS** contains **PASS** within it. If you have not purchased **PASS**, you will be able to try it out for 30 days from the date you first use it. After the trial period, you will need to purchase a separate license to continue using **PASS**.

The installation procedure (Setup) creates the necessary directories and copies the **NCSS** and **PASS** programs from the CD to those directories. The files on the CD are compressed, so Setup decompresses these files as it copies them to your hard disk.

The directories created by Setup are (either NCSS97 or NCSS2000 may be substituted below):

\NCSS2000 (or your substitute directory) contains most of the program files.

\NCSS2000\DATA contains all of the database files used by the tutorials. We recommend creating a sub-directory of this directory to contain your data.

\NCSS2000\JUNK contains temporary files used by the program while it is running. Under normal operation, NCSS will automatically delete temporary files. After finishing NCSS, you can delete any files left in this directory.

\NCSS2000\REPORT is the default directory in which to save your output.

\NCSS2000\SETTINGS contains the files used to store your program options. These files are used by the **NCSS** Template system which is described later.

\NCSS2000\STS contains all labels, text, and online messages. The text in these files may be customized. For example, you may want to modify report headings or help messages. You may even want to translate this text into languages other than English.

Setup places a file called NCSS97.INI in your Windows directory. This file contains all default settings, paths, and constants that are used by the system. This file is documented in README.WRI.

If you have a previous version of NCSS

If you are upgrading from a previous version of **NCSS**, instruct the Setup program to install the new version in the same directory as your previous version (usually \NCSS97). All appropriate files will be replaced. This includes your template files in the SETTINGS directory. If you want to keep these, you must copy them to a separate directory before you begin the installation and copy them back after completing the installation.

Installing NCSS

This section gives instructions for installing **NCSS** on your computer system. You must use the **NCSS** Setup program to install **NCSS**. The files on the CD are compressed, so you cannot simply copy the diskettes to your hard drive.

After you run Setup, you should read the NCSS README.WRI file for late-breaking information before starting NCSS.

Follow these basic steps to install NCSS on your computer system.

Step Notes

- 1. Make sure that you are using a 32-bit version of Windows such as Windows ME or Windows 2000.
- 2. Insert the CD in the CD drive. On the Start menu, select the Run command. Enter **D:Setup** (You may have to substitute the appropriate letter for your CD drive if it is not D.).
- 3. Once Setup starts, simply follow the instructions on the screen. **NCSS** will be installed in the drive and directory you designate.

If something goes wrong during installation

The installation procedure is automatic. You simply put the appropriate diskettes in the floppy drive when directed. If something goes wrong during installation, delete the \NCSS97 directory and start the installation process at the beginning. If trouble persists, contact our technical support staff as indicated below.

Obtaining the Documentation

A complete set of documentation is contained on this CD in the directory /NCSS97/DOCS. This directory contains Adobe Acrobat *PDF* files that can be easily browsed and printed. A comprehensive table of contents is contained in the text file _READ_ME.TXT. You can access this file by double-clicking on it from Windows Explorer or by loading it into your word processor.

The DOCS directory also contains a free copy of Adobe Acrobat Reader 4.0. You can install the reader by double-clicking on the file *Acrd4enu.exe*. Note that this is a copyrighted program from Adobe. You should read their licensing agreement that says that you can not sell the Reader program.

Note that to access the CD, you insert it and wait for the installation window to appear. Instead of installing the software, select *Cancel Installation*. Now you can use Windows Explorer to browse the CD.

Starting NCSS

NCSS may be started using your keyboard or your mouse using the same techniques that you use to start any other Windows application.

Starting NCSS using your mouse

You can start NCSS by selecting NCSS from your Start menu using standard mouse operations.

Starting NCSS using your keyboard

You can start NCSS by selecting NCSS from your Start menu using standard keyboard operations.

Obtaining Help

Online Help

To help you learn and use **NCSS** efficiently, most of the material in this manual is included in the online Help. The online Help is started from the Help Menu.



Since the Help information is stored electronically, it can be changed more quickly than the printed manual. Hence, you should always look to the online Help for information on procedures that is not contained in this manual. Also, whenever you notice differences between the online instructions and the printed instructions, you should assume that the online instructions are more current and follow them.

Using Help

There are a few key features of our help system that, if you understand, will let you use the online help more efficiently.

First, the Contents button brings up the table of contents of the help system. Use the Contents button to quickly navigate through the Help system.

Second, each chapter was designed to be easily navigated. You can then proceed through a chapter section by section using the period and comma keys on your keyboard.

Finally, you can use the Index and Find buttons to bring up an index of subjects.

Technical Support

To help us answer your questions more accurately, we may need to know about your computer system. Please have pertinent information about your computer and operating system available. Also, many help calls will require us to have an understanding of your data. Be prepared to provide background on your data.

You can contact our technical support by calling (801) 546-0445 between 8 a.m. and 5 p.m. (MST). You can contact us by email at Support@NCSS.COM or by fax at (801) 546-3907. Our goal is to respond to Email within 24 hours and to faxes within 3 days, so please use Email whenever possible.

CHAPTER 2

Creating a database

About this chapter (Time: 21 minutes)

This chapter will show you how to enter, label, save, and print a database. You will find complete coverage of these subjects in the first four chapters of the *NCSS Users Guide*.

Starting NCSS

Select Programs - NCSS from the Start menu to start NCSS. After starting, the NCSS spreadsheet program appears with an empty datasheet. We will begin by entering data into this datasheet.

😫 NCS	S Data -	[Untitled]							_ 🗆 ×
<u>F</u> ile <u>E</u> o	dit <u>D</u> ata <u>A</u>	<u>malysis G</u> r	aphics <u>W</u> ii	ndow <u>H</u> elp					
	🍝 🖳 🗲		∾ F	¥± 💼 O	- D §	🧕 🚮 📴	× 💉 🎢	FREE LL 🔨	12
	C1	C2	C3	C4	C5	C6	C7	C8	C9 🔺
1]							
2									
3									
4									
5									
6									
7									
Variabl	le Info Sh	eet <u>1</u>							
1 1									

Brain Weight Data

The following data give the body weight in kilograms and the brain weight in grams of various mammals. This chapter will show how to enter these data into an **NCSS** database and perform basic database operations such as saving and printing.

Mammal	Body	Brain
<u>Name</u>	Weight	<u>Weight</u>
African Elephant	6654	5712
Asian Elephant	2547	4603
Giraffe	529	680
Horse	521	655
Cow	465	423
Gorilla	207	406
Pig	192	180
Jaguar	100	157
Man	62	1320
Chimpanzee	52	440
Gray Wolf	36	120
Kangaroo	35	56
Baboon	11	179
Red Fox	4	50
Cat	3	26

Entering a column of data

Take the following steps to enter the brain weight data into NCSS :

1 Position the cursor in the upper-left cell.

This is done by clicking in the cell just below the *C1*.

	C1	C2	C3	C4	C5
1					
2					
3					
4					
5					
6					
7					

2 Type African Elephant.

Notice that as you type, the characters appear in two places: in the cell where you are typing and in the cell-edit box at the top of the sheet.

A1	1 1	A	rican Elephant			
	et	C2	C3	C4	C5	1
1	🔺 an Elephar	nt				
2						
3						
4						
5						
C						

3 Press *Enter*.

The text is entered and the cell cursor (the dark border around the cell) moves down to the next cell.

	C1	C2	C3	C4	C5
1	African Ele	phant			
2					
3		• •۲			
4					
5					

- Type Asian Elephant.
 Press Enter.
 Type Giraffe.
 And so on until you finish entering the names.
- 5 Using the vertical scroll bar or the *Page Up* key, reposition the screen so that you can begin entering data in the second column. Click in the first row of column two. This will highlight this cell.
- 6 Type in the second and third columns of numbers. The completed table should appear as shown.

To cancel an entry, you can press the Esc key. If you have already pressed Enter, you can choose Undo from the Edit menu.

	C1	C2	C3	C4	C5	t
11	Gray Wolf					
12	Kangaroo					
13	Baboon					
14	Red Fox					
15	Cat					
16] 🖧				
17						+
+					+	

	C1	C2	C3	C4	C5	t
1	African Ele	phant				
2	Asian Elep	hant				
3	Giraffe					
4	Horse					
5	Cow					
6	Gorilla					
7	Dia					+
+					+	

	C1	C2	C3	C4	C5	t
1	African Ele	6654	5712			
2	Asian Elep	2547	4603			
3	Giraffe	529	680			
4	Horse	521	655			
5	Cow	465	423			
6	Gorilla	207	406			
7	Pig	192	180			
8	Jaguar	100	157			
9	Man	62	1320			
10	Chimpanze	52	440			
11	Gray Wolf	36	120			
12	Kangaroo	35	56			
13	Baboon	11	179			
14	Red Fox	4	50			
15	Cat	3	26			Ŧ
+					+	

Labeling a variable

In **NCSS**, a column of data is called a *variable*. Each variable has a number and a name. The number is its column number. The name is the label at the top of the column. The name of the variable will be displayed in all statistical reports and graphs that you generate, so it is important to name variables so that they will be remembered.

In a new database, the variables receive the default names C1, C2, C3, etc. Hence, you have just entered data into variables C1, C2, and C3. We will now show you how to change the names of these variables.

1 Click on the Variable Info tab.

	C1	C2	C3	C4	C5	t
1	African Ele	6654	5712			
2	Asian Elep	2547	4603			
3	Giraffe	529	680			
4	Horse	521	655			Ŧ
+				-	+	

Variable Info Sheet1

2	Click in the C1 cell.		Name	Label	Transformation	Format	1
	·	1	<u>ct→ eb</u>				
	This will position the cell cursor	2	C2				
	in that cell. (The cell cursor	3	C3				
	may already be there.)	4	C4				Ŧ
		+			1	→	

3	Type Name.						_
-	Press Enter		Name	Label	Transformation	Format	+
	Type Body Weight	1 →	Name				
	(Use the underscore, not the	2	Body_Weig	ght			
	minus sign in these names.)	3	Brain_Wei	ght			
	Press <i>Enter</i> .	4	C4				Ŧ
	Type Brain_Weight .	+				→	
	Press <i>Enter</i> .	Variable	e <u>I</u> nfo Shea	et <u>1</u>			_

4 Click on the Sheet1 tab. _

This will return you to a view of the data. The screen should appear like this.

	Name	Body_We	Brain_We	C4	C5	t
1	African Ele	6654	5712			
2	Asian Elep	2547	4603			
3	Giraffe	529	680			
4	Horse	521	655			
5	Cow	465	423			
6	Gorilla	207	406			
7	Pia	192	180			Ŧ
+					÷	

The final step is to widen the columns so that the complete names and labels are shown.

5 Drag the mouse from the *Name* heading to the *Brain_Weight* heading. This is done by pressing the left mouse on the

	Name	Body_We	Brain_ # 'e	C4	C5	t
1	African Ele	6654	5712			
2	Asian Elep	2547	4603			
3	Giraffe	529	680			
4	Horse	521	655			
5	Cow	465	423			
6	Gorilla	207	406			
.7	Pia	192	180			ŧ
+					→	

heading *Name* and, without letting up, moving the mouse pointer to the heading *Brain_Weight* and finally letting up on the mouse. All three columns (headings and data) will be darkened.

6 Now, position the mouse between the two columns. The mouse pointer will change to a two directional arrow.

	Name 🙌	₿ody_We	Brain_We	C4	C5	t
	African Ele	6654	5712			
2	Asian Elep	2547	4603			
3	Giraffe	529	680			
4	Horse	521	655			
5	Cow	465	423			
6	Gorilla	207	406			
7	Pia	192	180			Ŧ
+					→	

7 Drag the mouse to the right until you are almost to the next border and let go of the mouse button.

		Name	Body_	f	Brain_V	C4	C5	C	t
	1	African E	665	1	5712				
	2	Asian Ele	254	7	4603				
	3	Giraffe	52)	680				
	4	Horse	52	1	655				
	5	Cow	46	5	423				
	6	Gorilla	20	7	406				
	7	Pia	191	2	180				Ŧ
+	-							+	

The columns will be widened, showing the complete variable names (column headings) and animal names.

	Name	Body_Weight	Brain_Weight	1
1	African Elephant	6654	5712	
2	Asian Elephant	2547	4603	
3	Giraffe	529	680	
4	Horse	521	655	
5	Cow	465	423	
6	Gorilla	207	406	
	Pia	192	180	Ŧ
+			→	

8 Click on a cell in the body of the table to cancel the selection (the reverse video).

	Name	Body_Weight	Brain_Weight	t
1	African Elepha	6654	5712	
2	Asian Elephant	. 2547	4603	
3	Giraffe	529	680	
4	Horse	521	655	
5	Cow	465	423	
6	Gorilla	207	406	
.7	Pia	192	180	Ŧ
+			→	

Variable names are used throughout the program to identify which columns of data to analyze. A variable name must begin with a letter (not a number); should contain only letters, numbers, and the underscore; and should not contain blanks. For correct formatting on reports, variable names should be less than fourteen characters, although there is no maximum length.

Saving your database

As you enter data, it is stored in your computer's temporary memory but not on your hard disk. If the computer loses power, you lose your data. We will now show you how to save the data to your hard disk.

1 Select *Save As* from the File menu of the **Data** window.

<u>F</u> lie	
<u>N</u> ew	
<u>0</u> pen	Ctrl+0
<u>C</u> lose	
A <u>d</u> d a Sheet	
Import	
Remove <u>L</u> ast Sheet	
Prin <u>t</u> er Setup	
Page Set <u>u</u> p	
<u>P</u> rint	Ctrl+P
<u>S</u> ave	Ctrl+S
Save <u>A</u> s	
E <u>x</u> por [®]	
<u>E</u> xit NCSS	

2	Double-click the Data directory to open it.	Save File As	s	-		? X
3	Enter <i>mydata.s0</i> in the File Name <i>box.</i>	Ancova.s0 Anstime.s0	Corres2.s0	■ Fnreg2.s0 ■ Fnreg3.s0 ■ Fnreg4 s0	al Intel.s0 al Item.s0 al Letinsors0	N N N
4	Click Save.	Bball.s0 Box320.s0 Box402.s0 Bresky-s0 Corres1.s0	Grossowr.s0 Davis467.s0 Davis467.s0 Ds476.s0 Fisher.s0 Fisher.s0 Foreg1.s0	Fruits0 Fruit	Ecambernia.so Leukemia.so Loglin1.s0 Mammals.s0 Mammals1.s0 Mammals2.s0	
		File <u>n</u> ame:	mydata.s0			•
		Save as type:	Spreadsheet*.SU		Canc	el

An **NCSS** database name must end with the file extension s0 (that's "s zero"). Hence, a valid file name would have numbers, spaces, and letters followed by the extension "s0". For example, you might use abc.s0.

The database is stored as two files on your hard disk. If you use Windows Explorer to view the Data directory, you will find that you have created two files: mydata.s0 and mydata.s1.

Printing your database

You will often want to create a printout of the data you have entered. We will now show you how this is accomplished.

1 Select **Data Report** from the Data menu.

The Data Report procedure appears. This window allows you to control the format of your report.

 Click on the button to the right of the Data Variables line.

Variables	
— Data Variables:	
1-2	
, Decimal Places:	
0,0	
Variable Names	· Value Labels: Precision:
Names	▼ Data Values ▼ Single ▼
, Label Justificatio	n: Data lustification:
Right	Right IDouble Space
First: Ma	aximum: Increment: Offset:
1.5 💌 7.0	D 🔻 1.0 💌 0.15 💌
🗖 Filter Active	

3	Select the first three variable	Data Variables
	names: Name,	Variable Selection List
	Brain Weight.	→ Name C10 C19 C28 Ok
	Press Ok	Brain_WeightC11 C20 C29 Brain_WeightC12 C21 C30 Cancel
	These variable names will appear in the Data Variables box.	C4 C13 C22 C31 C5 C14 C23 C32 C6 C15 C24 C33 C7 C16 C25 C34 C8 C17 C26 C35 C9 C18 C27 C36 C9 C18 C27 C36
		Variables Selected Name-Brain_Weight Select All Clear Store as Numbers
4	Enter 2.0 in the <i>First</i> box of the <i>Tabs</i> section at the bottom of the window.	Variables Implate Data Variables: Name-Brain_Weight Name-Brain_Weight Implate Decimal Places: 0.0 Variable Names: Value Labels: Precision: Names Data Values Single Label Justification: Data Justification: Split Column Headings Right Right Double Space Tabs Tabs First: Maximum: Increment: Offset: Image: Tabs Toto 0.15 Image: Toto Filter Active Toto Toto Toto
5	Press the <i>Run</i> button on the right of the toolbar at the top	

right of the toolbar at the top of the window.

The final result will appear as shown.

# NCSS Outpu	ıt - [Output]					- 🗆 🗙
lle <u>E</u> dit <u>V</u> ie	w F <u>o</u> rmat <u>W</u> indow	<u>H</u> elp				_ 8 ×
• • • • • •	6 🖻 🚰 🗠 F	¶ 🚥		•	2 🗵	1 271
					[Data R 📤
Page	1					
Databa	ase G:\NC	CSS60\E		AMMAL	.S.S0	
Time/E)ate 08:44	-45 06-1	6-1997			
Data L	ist Section					
Row	Name	Body_	Weight	Brain	_Weigh	nt
1	African Elephant		6654		571	2
2	Asian Elephant		2547		460	3
3	Giraffe		529		68	0
4	Horse		521		65	5
5	Cow		465		42	3
6	Gorilla		207		40	6
7	Pig		192		18	0
8	Jaguar		100		15	7
9	Man		62		132	0
10	Chimpanzee		52		44	0
11	Gray Wolf		36		12	0
12	Kangaroo		35		5	6
13	Baboon		11		17	9
14	Red Fox		4		5	0
15	Cat		3		2	6
						-
•						
		Page	1/1	Line	1 Col	1

6 Finally, select *Print* from the File menu of the Output window. This will display the Print dialog box from which you can print the report.



Congratulations! You have successfully entered and printed a set of statistical data. Analyzing these data using the various statistical procedures will not be much more difficult.

Clearing the database

As you move from analysis to analysis, you will often have to clear the datascreen so that new data may be entered. This is done as follows. (Of course, you should save your data before clearing it!)

1	Select New from the File menu of the Data window. (Use the Windows menu to transfer from the Output window to the Data	<u>File</u> <u>N</u> ew <u>O</u> pen <u>C</u> lose	Ctrl+0	
	window.)			
	(If you have not previously saved your data, choosing New will cause the program to ask you if you want to save the current datasheet before it is cleared.)			
2	Click Ok	Create a Ne	w Data File	
	This will clear the screen and present you with an empty file just like when you start the program.	Step 1 Selec © Spreads © Databas	t Type of Data File sheet (SUTITE)	Step <u>2</u> Continue

NCSS maintains two data formats. The spreadsheet (S0-type) format is for routine databases of under 1000 rows. The database (S0Z-type) format is for databases with more than 1000 rows.

The three NCSS windows

As you have just seen, **NCSS** is controlled by three windows: Data, Procedure, and Output. Each window has its own menu bar. Be sure you are in the correct window when you use the menu. For example, the Save As command in the Data window saves your data, the Save Template command in the Procedure window saves the procedures's current settings, and the Save As command in the Output window saves the current report. It is easy to forget which window you are in!

The **NCSS Data** window contains the data that is currently being analyzed. This window lets you view, modify, and save your data. It has the look and feel of a spreadsheet.

Chapter 7 provides a closer look at the Data window.

This is the main **NCSS** window. Closing this window will exit the program.

The **NCSS Procedure** windows let you set the options for a particular analysis. Whether you are running a multiple regression, an ANOVA, or a scatter plot, you will set the options of this procedure in the Procedure window.

Chapter 8 provides a closer look at the Procedure window.

Closing this window will not exit **NCSS**.

Bile Ec	i <mark>S Data - [G:∖NO</mark> lit <u>D</u> ata <u>A</u> nalysis	SS60\DATA\A Graphics Windo	MAMMALS.SO]	_ 🗆 X
	🛎 🔛 🔏 🗎			2 % 1
Africa	n Elephant			
	Name	Body_Weight	Brain_Weight	C4 🔺
1	African Elephant	6654	5712	
2	Asian Elephant	2547	4603	
3	Giraffe	529	680	
4	Horse	521	655	
5	Cow	465	423	
6	Gorilla	207	406	
7	Pig	192	180	-
•	-			
Variabl	e Info Sheet <u>1</u>			
1 1				

🛱 Data Report	_ 🗆 ×
<u>File Bun Analysis G</u> raphics <u>W</u> indow <u>H</u> elp	
▶ ▶ ₽ ₽ ₩	👻 🢡 🍞
<u>V</u> ariables <u>T</u> emplate	
Data Variables:	
Name-Brain_Weight	
Decimal Places:	
0.0	
Variable Names: Value Labels: Precision:	
Names 🔽 Data Values 🔽 Single 💌	
Label Justification: Data Justification: Split Column Headings	
Pignt _ Pignt _ Double Space	
2.0 🔻 7.0 💌 1.0 💌 0.15 💌	
Filter Active	
1	

The **NCSS Output** window displays the output from the statistical and graphics procedures. It serves as a mini-word processor--allowing you to view, edit, save, and print your output.

Chapter 9 takes a closer look at the Output window.

Closing this window will not exit **NCSS**.

NCSS Out	put - [Output]			_ 🗆 ×
🧆 <u>F</u> ile <u>E</u> dit <u>Y</u>	<u>/</u> iew F <u>o</u> rmat <u>W</u> indov	v <u>H</u> elp		_ 8 ×
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				Data F
Page Data Time	e 1 base G:\l v/Date 09:1	NCSS60\DATA\M 02:52 06-16-1997	AMMALS.S(0
Data	List Section			
Row 1 2 3 4 5	African Elephan Asian Elephan Giraffe Horse Cov	Body_Weight t 6654 t 2547 529 521 v 465 207	Brain_We	ight 5712 4603 680 655 423 ↓00
		Page 1M	Line 1	
		Page 1/1	Line 1	Col 1

Moving from window to window

There are several ways of moving among the windows:

- 1 Remove the windows you are not currently using by minimizing them.
- 2 Arrange the windows on your screen so that all can be seen.
- 3 Use the task bar along the bottom of your screen.
- 4 Use the Windows menu.
- 5 Use the Navigator.
- 6 Use the toolbar (this is usually the quickest and easiest).

CHAPTER 3

Data Transformation

About this chapter (Time: 13 minutes)

This chapter continues the introduction to the **NCSS** system by taking you through examples of using transformations to create new variables. Specifically, you will be shown how to calculate percentages and how to recode the values of a variable.

Starting NCSS and loading a database

New.

Open.

Close

If NCSS is not already running, start it up now by clicking on the NCSS icon (refer to the beginning of Chapter 2 for details). We will use the brain weight data that was entered in Chapter 2. These data are stored in the MAMMALS database in the \NCSS\DATA subdirectory. To begin this tutorial, take the following steps to load the MAMMALS database.

🛿 NCSS Data - [Untitled]

File Edit Data Analysis Graphics Window

1 Select *Open* from the File menu of the Data window.

The File Open window will appear.

2 Double click the **Data** subdirectory to select it.



Ctrl+O

. 🗆 🗙

<u>H</u>elp

18 Data Transformation

- 3 Double click *mammals.s0* in the list of available files.
- 4 Click the **Open** button.

This will load the MAMMALS database into the Data window.

~

Select a File	e to Open			? ×
Look <u>i</u> n:	🔁 Data	•	🗈 🛃 🔚	
Mammals.su Manova1.so Mantel.so Mds2.so Mds3.su Mlco2.so Odor.so Pass1way.si	Pca2.s0 Pie.s0 Pizza.s0 Plant.s0 Probit.S0 Qatest.s0 Regctus.s0 0 Regctus.s0 0 Repmeas2.s0	a) Resale.s0 a) Rndblk1.s0 a) Rndblock.s0 a) Road.s0 a) Robins.s0 a) Roc.s0 a) Ruspini.s0 a) Sales.s0	a) Sample.s0 a) Sample1.s0 a) Seriesa.s0 a) Sunopot.s0 a) Survival.s0 a) Survival.S0 a) Survival1.S0 a) Vpi.s0	
•				►
File <u>n</u> ame:	Mammals.s0		<u>O</u> pen	
Files of type:	Spreadsheet (*.S0)		Cance	1

Creating a percentage variable

5 Click on the *Variable Info* tab. This will position you in the Variable Info datasheet.

Filo Ec	S Data - [D.)VA	Craphics Windo	mais.suj v Holp	
		A P F A		<u>Ø</u> 두
Africa	n Elephant			
	Name	Body_Weight	Brain_Weight	C4
1	African Elephant	6654	5712	
2	Asian Elephant	2547	4603	
3	Giraffe	529	680	
4	Horse	521	655	
5	Cow	465	423	
6	Gorilla	207	406	
7 Pig		Pig 192	180	l i
•	-			►
Variabl	e Info Sheet <u>1</u>			
1				

6 In the *Transformation* column, click on the fourth cell down--the one in the *C4* row.

> This will position the spreadsheet cursor in this cell. This is where the transformation will be entered.

_				
NCS	S Data - [D:\0A70\E)ATA\Mammals.s0	
<u>F</u> ile <u>E</u> d	it <u>D</u> ata <u>A</u> r	nalysis <u>G</u> rap	ohics <u>W</u> indow <u>H</u> elp	
D 😂	🛩 🔛 🐰	🕒 🔒 🖊	🗠 🖪 🏹 🏣 🛛	📃 🧕 🗞 🖡
+				
	Name	Label	Transformation	Format 🔺
1	Name			
2	Body_Wei	ght_		
3	Brain_Wei	ght		
4	C4			
5	C5		<u>k</u>	
6	C6			
7	C7			•
•				
Variabl	e Info She	et <u>1</u>		
3 4				

7 Type in the transformation expression: *Brain_Weight/Body_Weight/10.* (Be sure to type the underscores!)

Press Enter.

Notice that you edit the transformation in the edit bar at the top of the spreadsheet.

This step enters the new transformation expression, but does not change the data. The data are not generated until the spreadsheet is manually recalculated.

8 Click on *C4* in the Name column and type *Percent* and press *Enter*.

This renames the variable from the default of C4 to a new value that better describes the data in this column.

F	i N File	CSS Data - Edit Data A	(D:\0A70) malysis Gr	DATA\Mammals.s aphics Window Help							
	- 2 º			·	📃 🧕 😪 📭						
	Brain_Weight/Body_Weight/10										
$\overline{\Lambda}$		Name	Label	Transformation	Format 🔺						
ŀ	1	Name									
	2	Body_We	ight								
	3	Brain_We	eight 📃	•							
4	4	C4		ht/Body_Weight/10							
	5	C5			Ъ						
1	5	C6									
	7	C7			-						
10	•				•						
•	Vari	able <u>I</u> nfo Sh	eet <u>1</u>								
3		4									

🗿 NC:	SS Data - [D:\0A70\E)ATA\Mammals.s0] <u> </u>
<u>F</u> ile <u>E</u>	dit <u>D</u> ata <u>A</u> r	nalysis <u>G</u> rap	ohics <u>W</u> indow <u>H</u> elp	
🗅 🖻	🎽 🖳 🞽	Þ 🔒 🖊	F 😤 🛅 🛛	📃 💆 😪 🖡
Perce	ent			
,	Name	Label	Transformation	Format 🔺
1	Name			
2	Body_Wei	ght		
3	Brain_We	ight		
4 🔺	Percent		Brain_Weight/Body_	_Weight/10
5	C5	Ń		
6	C6	2		
7	C7			-
•				►
Variab	l e <u>I</u>nfo She	et <u>1</u>		
1 4				

9 Double click on the cell in the fourth row in the *Format* column.

This will display the Format window for editing the format of the Percent variable. Note that this format will not influence the internal precision of the data.

Name	Label	Transformation	Format
Name			
Body_Weig	ght		
Brain_Wei	ght		
Percent		Brain_Weight/Body_	Weight/10
C5			5
C6			U
C7			
			•
	Vame Vame 3ody_Weiq 3rain_Wei Percent C5 C6 C7	Vame Label Name Body_Weight Brain_Weight Percent C5 C6 C7	Vame Label Transformation Name 3ody_Weight 3rain_Weight Brain_Weight 9ercent Brain_Weight/Body_ 25 26 27

10 Select the two-decimal format: 0.00 from the list.

> Although it is not necessary to reformat the numbers, it will make viewing them much easier.



The completed screen will appear like this.

11 Click the Apply T button on the tool

> This will cause all be recalculated.

12 Click the Sheet1

reen will appear like	🗿 NCS	S Data - [D:\0A70\[DATA\Mammals.s0)] _ [⊐×	
	<u>F</u> ile <u>E</u> d	it <u>D</u> ata <u>A</u> r	nalysis <u>G</u> rap	ohics <u>W</u> indow <u>H</u> elp			
		🛩 🔛 🗴	b 🔒 🖊		📃 💆 🐬	ZFF 🚺	
ransformation	0.00						
bar.		Name	Label	Transformation	Format		
	1	Name					
l transformations to	2	Body_Wei	ght				
transformations to	3	Brain_Wei		_			
	4	Percent		Brain_Weight/Body	0.00		
	5	C5			4		
	6	C6			_		
tab	7	C7				-	
	I	-					
	Variable Info						
	4 4						

This is the final result.

Notice the new column of data in the Percent variable's column.

You can see that the data is actually stored in double // precision.

E	🖗 NCS	S Data - [D:\0A	70\DATA\Marr	mals.s0]	_							
	<u>F</u> ile <u>E</u> d	it <u>D</u> ata <u>A</u> nalysis	<u>G</u> raphics <u>W</u> indo	w <u>H</u> elp								
	D 🔗	🛩 🔛 🐰 🖻 🗑	🛓 🚧 🗠 🖪 🕹	: 💼 🛛 🔜 .	🧕 😪 🖡	▼ ∢						
ľ						=						
	0.0858431018935978											
1		Name	Body_Weight	Brain_Weight	Percent	C5_						
	1	African Elephant	6654	5712	0.09							
	2	Asian Elephant	2547	4603	0.18							
	3	Giraffe	529	680	0.13							
	4	Horse	521	655	0.13							
	5	Cow	465	423	0.09							
	6	Gorilla	207	406	0.20							
	7	Pig	192	180	0.09							
	8	Jaguar	100	157	0.16							
	9	Man	62	1320	2.13	-						
	•	I										
	Variable	e Info Sheet <u>1</u>										
ŀ	4 1											

If you change or add data to either *Body_Weight* or *Brain_Weight*, the *Percent* variable's values will <u>not</u> be automatically recalculated. You must recalculate the database using the **Apply Transformation** button or the **Recalc All** option of the Data menu.

Also remember that these changes are not automatically saved on your hard disk. If you want a permanent copy of a database with new transformations, you must save this modified version of the database using the Save option of the File menu in the Data window.

Data Type 🛛 Valı 🕈

0

Recoding a variable

It is often necessary to recode the values of a variable. As an example, we will recode the body weights to form a new variable as follows. Animals with a body weight less than 100 kg will receive a value of 1. Animals with a body weight greater than or equal to 100 kg will receive a value of 2. The transformation formula that will accomplish this is $(Body_Weight >= 100) + 1$. The expression inside the parentheses results in a "1" if it is true or "0" if it is false. We will call the new variable SizeGroup.

Click the Variable Info tab. 1

		Name	Body_Weight	Brain_Weight	Percent	C5	1
	1	African Elephant	6654	5712	0.09		
	2	Asian Elephant	2547	4603	0.18		
	3	Giraffe	529	680	0.13		
N	4	Horse	521	655	0.13		
11	\5	Cow	465	423	0.09		
		o '''	500	400	0.00	_	
	+						→
t	Variable	e Info Sheet1					

Transformation Format

Brain_Weight/Body_0.00

\$

				Name	Label	Transformation	Format	Data Type	Valu	t		
2 Click the C5 name					1	Name						
						2	Body_Wei	ght				
2	2 Click the C5 name.					3	Brain_Wei	ght				
			4	Percent		Brain_Weight/Body_	0.00					
			5	C5 🕹								
			2		1					ž		

Name Label

Body_Weight Brain_Weight

Percent

C6

0.00

SizeGroup

- 3 Type SizeGroup and press Enter.
- 4 Click in the cell in the fifth row and third column.
- Type (Body_Weight>=100 5 and press Enter.

		Name	Label	Transformation	Format	Data Type	Valu	t
Type (Body_Weight>=100)+1	2	Body_Wei	ght					
and press Enter	3	Brain_Wei	ght					
	4	Percent		Brain_Weight/Body_	0.00			
	5	SizeGroup		<u>(Body_Weight>=100</u>)+1			
	6	C6		<u>~</u>				Ŧ
	- -	67					→	Ì
Press the <i>Apply</i>	🥵 N	CSS Dat	ta - [D:\()A70\DATA\Ma	mmals.s0]	_ [×	Ī
Transformations button to	File	<u>E</u> dit <u>D</u> at	a <u>A</u> nalys	is <u>G</u> raphics <u>W</u> ind	low <u>H</u> elp			1
generate the new values.		-	1 X 🖻	🛍 🛱 🗠 F	×÷ 💼 0	2 2 5	877	

7 Click on the **Sheet1** tab to return to the data.

Press the Apply

6

	Name	Label	Transformation	Format	Data Type	Valı ↑
2	Body_Wei	ght				
3	Brain_Wei	ight				
4	Percent	ſ	Brain_Weight/Body	_0.00		
5	SizeGroup	1	(Body_Weight>=10	0)+1		
6	_C6			1		
				<u>т</u>		→
Varia	hle Info She	et1 k				

The final result appears like this.

	Name	Body_Weight	Brain_Weight	Percent	SizeGrou (C6	t
1	African Elephant	6654	5712	0.09	2		
2	Asian Elephant	2547	4603	0.18	2		
3	Giraffe	529	680	0.13	2		
4	Horse	521	655	0.13	2		
5	Cow	465	423	0.09	2	굕	
6	Gorilla	207	406	0.20	2		
7	Pig	192	180	0.09	2		
8	Jaguar	100	157	0.16	2		
9	Man	62	1320	2.13	1		
10	Chimpanzee	52	440	0.85	1		
11	Gray Wolf	36	120	0.33	1		
12	Kangaroo	35	56	0.16	1		
13	Baboon	11	179	1.63	1		
14	Red Fox	4	50	1.25	1		
15	Cat	3	26	0.87	1		
16						_	+
+						→	

Saving the changes

It is important to save changes to your database. Take the following steps to do this.



The MAMMALS database on your hard disk will be replaced with the revised edition.

CHAPTER 4

Running Descriptive Statistics

About this chapter (Time: 8 minutes)

This chapter continues the introduction to the **NCSS** system by taking you through an example of using **NCSS** to obtain descriptive statistics.

Running descriptive statistics

In this section, you will generate descriptive statistics (mean, standard deviation, etc.) on the Body_Weight variable in the MAMMALS data. To begin, start **NCSS** and load the MAMMALS database. Detailed instructions for doing this are at the beginning of Chapter 3. After the database is loaded, follow these steps to run the procedure:



The Descriptive Statistics window will appear.

The next step is to select the variables to be analyzed.

2 Double click in the Variables box or click the small button to the right of this box.

This will cause the Select Variables button to appear at the top of the window.

⊻ariables Reports	Prob Plot Histogram Template	
Variables:		
Exponent	Additive Constant	
None •		
Group 1 Variable:	Group 4 Variable:	
	±	
Group 2 Variable:	Group 5 Variable:	
	<u><u>+</u><u>+</u></u>	
Group 3 Variable:	Frequency Variable:	
	<u>+</u>	
Eiltor Activo		

This will cause the Variables window to appear.

4 Click on *Body_Weight* in the Variable Selection List box.

The variable will appear in the Variables Selected box.

5 Click Ok.



6 Press the **Run** button to run the / procedure and generate the following output report.

Descriptive Statist File Run Analysis Gra	tics phics Window Help	
Variables Reports Variables:	Prob Plot Histogram	Implate
Exponent None	Additive Constant	·
Group 2 Variable:	Group 5 Variable:	
Group 3 Variable:	Frequency Variable:	L

The results are displayed in **NCSS**'s word processor.

You can scroll through the output using the scroll bars. You can enlarge this window by double-clicking the title bar-the blue bar at the top containing the words NCSS Output.

# NCSS	6 Output - [Ou	tput]						×
🔶 <u>F</u> ile <u>E</u>	<u>E</u> dit <u>V</u> iew F <u>o</u> rm	at <u>W</u> indow <u>H</u> elp						킨즈
🍷 🖻 🔮] 🍯 👗 🖻 健	🏘 🗠 🗜 🖺 🚥		🔲 🧕 🗵 🖋 🗿	f 🚟 📠 😟 🔟 🗄	<u>*</u>		
				Descriptive Sta	uauca ixepoir			
	Page	1						_
	Database	D:\0A70\D	ATA\Mammals.	SO				
	Time/Date	14:46:54 0	6-16-1997					
	Summary Sec	tion of Body_We	eight					
			Standard	Standard				
1	Count	Mean	Deviation	Error	Minimum	Maximum	Range	
1	15	761.2	1751.285	452.1798	3	6654	6651	
	Counts Section	on of Body_Weig	ht					
		Sum of	Missing	Distinct		Total	Adjusted	
	Rows	Frequencies	Values	Values	Sum	Sum Squares	Sum Squares	
	15	15	0	15	11418	5.162936E+07	4.293798E+07	
	Means Section	n of Body_Weigh	nt					
				Geometric	Harmonic			
	Parameter	Mean	Median	Mean	Mean	Sum	Mode	
	Value	761.2	100	110.7553	18.92759	11418	3	
	Std Error	452.1798				6782.697		
	95% LCL	-208.6292	35			-3129.438		
	95% UCL	1731.029	521			25965.44		
	T-Value	1.6834						
	Prob Level	0.114454						
	Count	15		15	15		1	
1								
1	Variation Sect	ion of Body_We	ight					
			Standard	Unbiased	Std Error	Interquartile		
	Parameter	Variance	Deviation	Std Dev	of Mean	Range	Range	
	Value	3066999	1751.285	1782.812	452.1798	486	6651	
	Std Error	2364186	954.5747		246.4701			
	95% LCL	1643940	1282.162		331.0529			
	95% UCL	7628365	2761.949		713.1323			
								-
•								•
						Page 1/3	Line 1 Col 1	

Don't be

intimidated by the amount of output. The default descriptive statistics report contains much more

information than any one person could use. Since **NCSS** is used by thousands of people, it must contain output for many different situations. You can generate only those reports you want by making appropriate selections on the Reports panel of the Descriptive Statistics window.

File Bun Analysis Graphics Window Help Image: Section transform
Lie Bun Anarysis Graphics Window Heip Image: Strain
Variables Reports Prob Plot Histogram Template Indicate whether to display this report or plot. Variables Reports Prob Plot Histogram Template Indicate whether to display this report or plot. Percentile Type: Alpha Level: Variable Names: Image: Plot Image: Plot Image: Plot Ave X(p[n+1]) 0.050 Image: Plot Names Image: Plot Image: Plot Value Labels: Precision: Image: Plot Image: Plot Image: Plot Image: Plot Value Labels: Precision: Image: Plot Image: Plot Image: Plot Image: Plot Value Labels: Precision: Image: Plot Image: Plot Image: Plot Image: Plot Value Labels: Precision: Image: Plot Image: Plot Image: Plot Image: Plot Value Section Image: Plot Image: Plot Image: Plot Image: Plot Image: Plot Value Labels: Precision: Image: Plot Image: Plot Image: Plot Image: Plot Image: Plot Image: Plot Image: Plot Image: Plot Image: Plot Image: Plot
Variables Reports Prob Plot Histogram Template Indicate whether to display this report or plot. Percentile Type: Alpha Level: Variable Names: Indicate whether to display this report or plot. Ave X(p[n+1]) 0.050 Names Indicate whether to display this report or plot. Value Labels: Precision: Indicate whether to display this report or plot. Value Labels: Precision: Indicate whether to display this report or plot. ✓ Summary Section ✓ Mean-Deviation Section Indicate whether to display this report or plot. ✓ Summary Section ✓ Mean-Deviation Section Indicate whether to display this report or plot. ✓ Means Section ✓ Percentile Section Indicate whether to display this report or plot.
 ✓ Variation Section ✓ Stem-Leaf Section ✓ Skewness Section ✓ Histogram Section ✓ Trimmed Section ✓ Probability Plot Section ✓ Quartile Section

28 Descriptive Statistics

We will now show a special trick to use when you want to view the graphics in more detail.

- 7 Scroll down through the output until reach the histogram.
- 8 Double-click the histogram to obtain a full-screen version of the histogram.





Saving the output

We will now show you how to save the output so that it can be imported into your favorite word processor.

Select Save As from the File 1 NCSS Output - [Output] - 🗆 X menu of the Output window. <u>File E</u>dit ⊻iew F<u>o</u>rmat _ 8 × Window Help New 🗠 F 🖪 🚥 🚥 🗙 💉 🎢 🖷 -Ш Ne<u>w</u> Log Test Prob Ctrl+O Open.. Value Level Ope<u>n</u> Log. 86.48257 Add Output to Log 0.4194072 0.000022 Save <u>A</u>s 4.2401 ŝŝ 3.7209 0.000199 Ctrl+P Print. 0.000000 31.8234 <u>C</u>lose dy_Weight <u>E</u>xit Histogram of Body_Weight त्रा 5.0 • Page 2/3 Line 78 Col This will bring up the Save File ? × Save File As As dialog box. - 🗈 💣 🏢 Save in: 🔶 🔁 Report 2prop.RTF 3d.RTF attchart.RTF bars.rtf contour.rtf errbar.RTF factor.RTF grid.rtf 🔊 nonlin.RTF Switch the current directory to ProbPlot.RTF the **Report** subdirectory which 🔄 surface.rtf was provided as a convenient 🖷 TT est.rtf 🗑 univar.RTF place in which to save your reports. *.RTF File <u>n</u>ame: <u>S</u>ave Save as type: Rich Text*.RTF • Cancel 2 Type *myreport.rtf* in the File ? × Save File As name box. - 🗈 💣 📰 Save <u>i</u>n: 🖻 Report 2prop.RTF 3d.RTF 🕙 nonlin.RTF ProbPlot.RTF 3 Click Save to save the report. attchart.RTF Cattchart.RTF Contour.rtf errbar.RTF factor.RTF grid.rtf 🔄 surface.rtf 편 TTest.rtf 🖥 univar. RTF MyReport.RTF File <u>n</u>ame: <u>S</u>ave Rich Text*.RTF • Save as type: Cancel

Note that the three-character extension "rtf" is very important. RTF stands for *rich text format*. Other programs, such as Microsoft Word and WordPerfect, recognize files with this extension as importable. Hence, using this extension makes sure that other programs will be able to import your report files.

As an exercise, run your word processor and load the myreport.rtf file.

Printing the output

We will now show you how to print the output.

1 Select *Print* from the File menu.

This will bring up the Print dialog box.



You can select which pages you want to print.

2 Click **OK** to begin printing.



CHAPTER 5

Running a Two-Sample T-Test

About this chapter (Time: 6 minutes)

This chapter continues the introduction to the NCSS system by taking you through an example of using NCSS to run a two-sample t-test.

Running a two-sample t-test

In this section, you will conduct a two-sample t-test on data in the MAMMALS1 database. To begin, start NCSS and load the MAMMALS1 database (be careful to load MAMMALS1, not MAMMALS). Detailed instructions for doing this are at the beginning of Chapter 3.

In this example,		NI	D.J. W.: LA	D:- W-:-L+	D	c:C	00	
we will compare		Name	Body_weight	Brain_weight	Percent	SizeGrou	UD	T
we will compare	1	African Elephant	L_L_ 6654	5712	0.09	2		
the average	2	Asian Elephant	- 2547	4603	0.18	2		
percent brain	3	Giraffe	529	680	0.13	2		
weight of small	4	Horse	521	655	0.13	2		
mammals (those	5	Cow	465	423	0.09	2		
under 100 kg in	6	Gorilla	207	406	0.20	2		
under 100 kg III	7	Pig	192	180	0.09	2		
weight) to the	8	Jaguar	100	157	0.16	2		
same average for	9	Man	62	1320	2.13	1		
large mammals.	10	Chimpanzee	52	440	0.85	1		
That is the	11	Gray Wolf	36	120	0.33	1		
man and a something	12	Kangaroo	35	56	0.16	1		
response variable	13	Baboon	11	179	1.63	1		
will be <i>Percent</i>	14	Red Fox	4	50	1.25	1		
and the grouping	15	Cat	3	26	0.87	1		
variable will be	16							
SizeGroup	17							+
SizeOroup.	+						→	

Remember to load the database from the Data window.

After the database is loaded, follow these steps to run the procedure:
1 From the T-Tests submenu of the Analysis menu, select **Two-Sample T-Test**.

S NC:	SS Data	- [D:\0A	.70\DAT#	\\Mami	nals1	.s0]			_ 🗆	
<u>F</u> ile <u>E</u>	dit <u>D</u> ata	Analysis	<u>G</u> raphics	Window	<u>H</u> elp					
🗅 🗃	📂 🔛	<u>A</u> NOVA		•			🧕 🖏 🖡	🗙 🛷 🖌		<u>ģ</u> ģ
		Clusterir	ng	•				ن خ ر خ ر ب		
Africa	an Elepha	<u>C</u> urve Fi	tting	•						_
	Name	Descrip	tive Statistic:	в 🕨	rain_	Weight	Percent	SizeGroup	C6	Ľ
1	African	Design	of <u>E</u> xperimer	nts 🕨		5712	0.09	2		
2	Asian E	Eurecas	iarig / Time : ieto Anelvoio	Senes •		4603	0.18	2		
3	Giraffe	Multivariate Analysis			680	0.13	2			
4	Horse		Suprivel Beliability			655	0.13	2		
5	Cow	Survival				423	0.09	2		
6	Gorilla	T-Tests		•	One	-Sample T-T	est 0.20	2		
7	Pig	<u>O</u> ther		~,	Pair	ed T-Test	0.09	2		
8	Jaguar [.]			100	Two	-Sample T-T	est 0.16	2		
9	Man			62		1320	2.13	1		
10	Chimpa	nzee		52		440	0.85	1		
11	Gray W	olf		36		120	0.33	1		
12	Kangaro	35			56	0.16	1			
• []								·	•	ſ
Variab	ile Info S	Sheet <u>1</u>								
1										

The Two Sample Tests procedure window will appear.

2 Double click in the *Response Variables* box.

This will cause the Response Variables selection window to appear.



- 3 Click on the *Percent* item in the Variable Selection List box.
- 4 Click Ok

Namo	C10	C19	C28		- Ok
Body_Weic	hCII	C20	C29		
Brain_Weig	htC12	C21	C30		Cancel
Percent	C13	C22	C31		
SizeGroup	C14 C15	C23	C32 C33		Help
C7	C16	C25	C34		
C8	C17	C26	C35		
C9	C18	C27	C36		
Variables Se	elected —				
Percent				A	
				_	
				-	

The T-Test window reappears. Note that the Response Variables has the entry *Percent*. This is the variable that was selected.

6 Double click the top **Group Variable** box.

This is the grouping variable. The average percent of those rows with a SizeGroup value of 1 (small animals) will be compared with the average percent of those rows with a SizeGroup value of 2 (large animals).

File Run Analysis Gra	st whics <u>W</u> indow <u>H</u> elp		
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Histogram ⊻ariables	Box Plot Reports	Template Prob Plot	
Response Variable(s):			
Percent		× ±	
Group Variables:		Value:))ha Level:)50 ¥	
	<u>±</u> –	Filter Active	

7 Select **SizeGroup** from the list of available variables.

8

available variables.	-Variable Sel	ection List—				
	Name	C10	C19	C28		Ok
Click Ok	Body_Wel Brain_Wel Percent SizeGroup C6	igC11 igC12 C13 C14 C15 C15	C20 C21 C22 C23 C24	C29 C30 C31 C32 C33		Cancel Help
	C7 C8 C9	C17 C18	C25 C26 C27	C34 C35 C36		Continue: Select the variables indicated and close this window.
	Variables Se SizeGroup	elected			4	
	Select All	Clear	🗌 🗖 Sto	re as Numb	ers	

3.6

9 Click the *Run* button to run the analysis.



The results are displayed in NCSS's word processor.

The t-test compares the mean percent of two groups. Often, all you will need is the t-value and associated probability level. These are contained in the Equal-Variance T-Test Section. In this case the t-value is 3.6560 and the probability level is 0.002904. Hence we reject the null hypothesis that means are equal.

A quick glance at the means of the two groups shows that the mean percent for small animals is 1.03 and for large animals is 0.13. Hence the two percentages are an order of magnitude apart!

The t-test chapter of the User's Guide goes into much more detail on how to perform a t-test analysis.

At this point, you could save or print the t-test report.

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	Page 1 Database D: ¹ Time/Date 12 Variable Pe	\0A70\DA :12:35 06- rcent	TA\MAMMAL -27-1997	Two-Samp	le Test Report	:	<u> </u>
	Descriptive Statistics S	Section					
	Variable SizeGroup=1 SizeGroup=2 Note: T-alpha (SizeGrou	Count 7 8 up=1) = 2	Mean 1.030351 0.1323353 .4469, T-alp	Standard Deviation 0.6971044 4.215593E oha (SizeGroup	Standard Error 0.263480 -02 1.490437 (=2) = 2.3646	d 95% LCL of Mean 07 0.3856372 7E-02 0.0970921	95% UCL of Mean 1.675065 0.1675786
	Confidence-Limits of D	Difference	Section				
	Variance Assumption Equal Unequal Note: T-alpha (Equal) =	DF 13 6.04 2.1604,	Mean Difference 0.8980159 0.8980159 T-alpha (Un	Standard Deviation 0.4745984 0.6983779 equal) = 2.443	Standard Error 0.245628 0.263901	d 95% LCL of Mean 3 0.3673689 19 0.2532655	95% UCL of Mean 1.428663 1.542766
◄	Equal-Variance T-Test	Section					
	Alternative Hypothesis Difference <> 0 Difference < 0 Difference > 0 Difference: (SizeGroup	=1)-(Size	T-Value 3.6560 3.6560 3.6560 Group=2)	Prob Level 0.002904 0.998548 0.001452	Decisior (5%) Reject He Accept H Reject He	Power (Alpha=.05) 0 0.921486 10 0.000000 0 0.964993	Power (Alpha=.01) 0.728374 0.000000 0.826251
	Aspin-Welch Unequal-	Variance	Test Sectior	ı			
	Alternative Hypothesis Difference <> 0 Difference < 0 Difference > 0 Difference: (SizeGroup	=1)-(Size	T-Value 3.4028 3.4028 3.4028 Group=2)	Prob Level 0.014303 0.992848 0.007152	Decision (5%) Reject He Accept H Reject He	Power (Alpha=.05) 0 0.809042 10 0.000001 0 0.911023	Power (Alpha=.01) 0.467812 0.000000 0.621317
	Tests of Assumptions	Section					
	Assumption Skewness Normality (Si Kurtosis Normality (Size Omnibus Normality (Size	izeGroup= eGroup=1 eGroup=1	=1)) 1)	Value 0.0000	Probability	Decision(5%) Cannot reject norma	ality
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CHAPTER 6

Running a Regression Analysis

About this chapter (Time: 10 minutes)

This chapter continues the introduction to the **NCSS** system by taking you through an example of regression analysis. Regression techniques analyze the relationship between a dependent (Y) variable and one or more independent (X) variables. **NCSS** has regression procedures for many different situations.

Running a regression analysis

In this section, you will conduct a regression analysis using the MAMMALS1 database. To begin, start **NCSS** and load the MAMMALS1 database. Detailed instructions for doing this are at the beginning of Chapter 3.

In this example we will investigate the relationship between *Brain_Weight* (dependent variable) and *Body_Weight* (independent variable).

	Name	Body_Weight	Brain_Weight	Percent	SizeGrou	C6	+
1	African Elephant	6654	5712	0.09	2		
2	Asian Elephant	2547	4603	0.18	2		
3	Giraffe	529	680	0.13	2		
4	Horse	521	655	0.13	2		
5	Cow	465	423	0.09	2		
6	Gorilla	207	406	0.20	2		
7	Pig	192	180	0.09	2		
8	Jaguar	100	157	0.16	2		
9	Man	62	1320	2.13	1		
10	Chimpanzee	52	440	0.85	1		
11	Gray Wolf	36	120	0.33	1		
12	Kangaroo	35	56	0.16	1		
13	Baboon	11	179	1.63	1		
14	Red Fox	4	50	1.25	1		
15	Cat	3	26	0.87	1		
16							
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Creating a scatter plot

The first step in a regression analysis is to plot the data.

1 From the Graphics menu, select *Scatter Plots*.



The Scatter Plot window will appear.

- 2 Click in the *Horizontal Variable(s)* box.
- 3 Enter **Body_Weight**.
- 4 Click in the Vertical Variable(s) box.
- 5 Enter *Brain_Weight*.
- 6 Click the *Run* button on the toolbar.

🛱 Scatter Plots _ 🗆 🗙 <u>File</u> <u>R</u>un Help Analys Window 🔹 🕨 🕒 🔛 🔛 🔜 🔜 🛃 🛪 🚿 🗯 հ 😟 🖄 2 ? Box Plot Dot Plot Sunflower Bars Template Select one or more variables (columns). Legend Lines 1 Lines 2 Transform Colors Horizontal Variables Titles Vertical Symbols Horizontal Variable(s): ^ **±** BODY_WEIGHT Vertical Variable(s) BRAIN WEIGHT _____ ▼ Grouping Variable: Plot Overlay • ₹ None Symbol Size Variable Minimum ¥ 50 ▼ 200 -Data Label Variable Ŧ Ŧ Filter Active Example1 - SAMPLE

The scatter plot shown at the right will appear. In order for regression analysis to be applied, the points in the plot should fall along an imaginary straight line.

While studying the plot, notice that all but two of the point are clustered in the lower left-hand corner. You cannot tell whether the points fall along a straight line. This suggests that a logarithmic scale should be used to display the data. This will be done next.



7 Press the *Horizontal* tab to display the Horizontal panel.

8 Select **Yes: Numbers** from the **Log Scale** pull-down list box.



The final result is the plot at the right. Notice that the points now appear to be evenly spread across the plot. Also note that the points appear to fall along an imaginary, upward-sloping straight line. This implies that a standard regression analysis should produce a reasonable model of this data.

Because of the logarithmic scale, our next task will be to create logarithmic versions of the two variables.



Create the logarithmic variables

Scatter Plots

File Run Analysis Graphics Window Help

 Press the *Data Window* button on the toolbar to bring the NCSS Data window to the front of your screen.

This will bring up the *NCSS Data* window.

2 Click on the Variable Info tab.

This will bring up the **Variable Info** screen.

- 3 In the sixth row of the Transformation column enter *Log(Body_Weight)*.
- 4 In the seventh row of the Transformation column enter Log(Brain_Weight).
- 5 In the sixth row of the Name column enter *LogBody*.
- 6 In the seventh row of the Name column enter *LogBrain*.

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		Name	Body_Weight	Brain_Weight	Percent	SizeGroup
	1	African Elephant	6654	5712	0.09	
	2	Asian Elephant	2547	4603	0.18	
ſ	3	Giraffe	529	680	0.13	
ľ	4	Horse	521	655	0.13	
Ī	5	Cow	465	423	0.09	
Ī	6	Gorilla	207	406	0.20	
h	7	Piq	192	180	0.09	
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		Name	Label	Transformation	Format	Data Type	
	2	Body_Wei	ght				
٦	3	Brain_Wei	ght				
	4	Percent		Brain_Weight/Body	0.00		
	5	SizeGroup		(Body_Weight>=100	D)+ 1		
1	6 🕨	LogBody		Log(Body_Weight)			
_	1	LogBrain	-	Log(Brain_Weight)			
	8	C8					-
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7 Click on the *Apply Transformations* button to create the tranformed data.

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8 Click on the **Sheet1** tab to return to your data. The datasheet will now appear as shown.

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2.60852603357719								
	Name	Body_Weight	Brain_Weight	Percent	SizeGroup	LogBody	LogBrain	C^
1	African Elephant	6654	5712	0.09	2	3.8230828	3.7567882	
2	Asian Elephant	2547	4603	0.18	2	3.40602894	3.66304097	
3	Giraffe	529	680	0.13	2	2.72345567	2.83250891	
4	Horse	521	655	0.13	2	2.71683772	2.8162413	
5	Cow	465	423	0.09	2	2.66745295	2.62634037	
6	Gorilla	207	406	0.20	2	2.31597035	2.60852603	
7	Pig	192	180	0.09	2	2.28330123	2.25527251	
8	Jaguar	100	157	0.16	2	2	2.19589965	1
9	Man	62	1320	2.13	1	1.79239169	3.12057393	
10	Chimpanzee	52	440	0.85	1	1.71600334	2.64345268	
11	Gray Wolf	36	120	0.33	1	1.5563025	2.07918125	1
12	Kangaroo	35	56	0.16	1	1.54406804	1.74818803	
13	Baboon	11	179	1.63	1	1.04139269	2.25285303	
14	Red Fox	4	50	1.25	1	0.60205999	1.69897	
15	Cat	3	26	0.87	1	0.47712125	1.41497335	1
16								-
•	1							•
Variable	e Info Sheet1							
7 6								_

Run the regression

1 Select *Multiple Regression* from the Regression/Correlation submenu of the Analysis menu.

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	Name	<u>D</u> escrip	tive Statistic	s		rain_Weight		Percent	Si	zeGr	
1	African	Design	of <u>E</u> xperime	nts		57	12	0.09)		
2	Asian E	<u>F</u> orecas	Eorecasting / Time Series Multivariate Analysis			46	03	0.18	3		
3	Giraffe	<u>M</u> ultivari	Multivariate Analysis				`				
4	Horse	<u>Regress</u> Ouelity (Regression / Correlation			An Possible P					
5	Cow	Survival	/ Reliabilit.	,		Canonical Co	aisal Models				
6	Gorilla	T-Tests	7 i tendonity	'	•	Correlation M	Correlation Matrix				
7	Pig	Other		Logistic Begression			ion				
8	Jaguar	-		100		Multiple Regr	ss	ion			
9	Man			62	1	Multi∨. <u>V</u> ariabl	e S	election			
10	Chimpa	nzee		52		<u>N</u> onlinear Reg	re	ssion			
11	Gray W	olf		36		Prop. Hazards	R	egression			
12	Kangaro	00		35		<u>R</u> esp. Surface	Re	egression			-
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Variab	le Info S	Sheet <u>1</u>				<u>S</u> tepwise Reg	res	sion			
1 4											

40 Regression Analysis

2	Click on the <i>Template</i> tab.	Hultiple Regression
	This screen provides a list of previously stored templates. Loading one of these templates saves you from having to set the options individually each time you run an analysis. The STANDARD template provides a set of commonly used reports.	Res X Res Acou Rstd X Rstd Hat Res Yhat Reports Prob Plot Htstegram Serial Corr Res Yhat Partial Res Storage 1 Storage 2 Template Variables Eile Name Template Directory Standard d:\0a70\settings*57 Template Files Template/directory Standard Default Default Default Example1 Standard Standard
3	Select Standard and press the Load / Template button.	
	The final step is to select the variables that are being analyzed.	Load Template Save Template
4	Click on the <i>Variables</i> tab.	Standard - A set of twoicel reports
		Hultiple Regression
		▁▶D☞▥
		Partial Res Storage 1 Storage 2 Template
5	Enter <i>LogBrain</i> for the <i>Y:Dependent</i>	Variables Reports Prob Plot Histogram Serial Corr Y: Dependent Variable(s): Variable(s): Variable(s): Variable(s):
6	Enter <i>LogBody</i> for the	
	X's:Independent Variables.	X's: Independent Variables:
		Weight Variable Alpha Level:
7		
1	Click the Run button on the toolbar?	Remove Intercept I Filter Active
	This will generate the following output.	
		Standard - A set of typical reports

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are the regression coefficients and R- Squared. These are	Page Database Time/Date Dependent	1 D:\0A 17:15 LogBi	√70\DATA\Marr 052 06-16-199 rain	nmals1.S0 7				
shown in the	Descriptive Statis	tics Sec	tion		Standard			
Regression Equation Section.	Variable LogBody LogBrain	C 1 1	5 5 5	Mean 2.044365 2.514187	Deviation 0.9507396 0.6733633	Minimum 0.4771213 1.414973	Maximum 3.823083 3.756788	
	Correlation Matrix	Section	n					
Regression Coefficients	LogBody LogBrain	LogB 1.0000 0.8705	lody Log 100 0.871 161 1.001	gBrain 0561 0000				
R-Squared	Regression Equa Independent Variable Intercept LogBody R-Squared	tion Sec R C 1 0 0	ction Coefficient .25368 .6165766 .757876	Standard Error 0.2166305 9.665737E-02	T-Value (Ho: B=0) 5.7872 6.3790	Prob Level 0.000063 0.000024	Decision (5%) Reject Ho Reject Ho	Power (5%) 0.999613 0.999952
	Regression Coeff Independent Variable Intercept LogBody T-Critical	ficient S R C 1 0 2	ection Regression Coefficient .25368 .6165766 .160369	Standard Error 0.2166305 9.665737E-02	Lower 95% C.L. 0.7856782 0.407761	Upper 95% C.L. 1.721682 0.8253921	Standardi Coefficier 0.0000 0.8706	ized ht
	Analysis of Variar	nce Sec	tion Sum of	Mean		Prob	Pow	/er
Scroll down to view the diagnostic plots.	Source Intercept Model Error Total(Adjusted)	DF 1 13 14	Squares 94.81707 4.810888 1.536967 6.347855	Square 94.81707 4.810888 0.1182282 0.4534182	F-Ratio 40.6915	Level 0.000	(5%) 1024 0.99) 19952
	Root Mean Square Mean of Depende	e Error nt	0.3438433 2 514187	R-Squared Adi R-Squa	0.7579 red 0.7393	Page	1/3 Line	▼ ▶ 1 Col 1



Of course, a complete regression analysis would require the studying of several reports and plots. A complete discussion of this is found in the multiple regression chapter of the *User's Guide*.

CHAPTER 7

Data Window

About this chapter

Data may be entered manually or imported from other files. The data are loaded in a spreadsheet from which they may be viewed, changed, stored, or printed. This chapter will show you how to manipulate your data using the spreadsheet.

Loading a database

The tutorial in Chapter 2 explained the mechanics of entering, storing, and printing a database, so that material will not be repeated here. Instead, this chapter will focus on manipulating the data with the spreadsheet after it has been loaded. Our first task will be to load in a previously saved database.

If NCSS is not already running, start it now by selecting NCSS from the Windows Start menu (refer to the beginning of Chapter 2 for details). We will use the brain weight data that was entered in Chapter 2. These data are stored in the MAMMALS database in the \NCSS97\DATA subdirectory. To begin this tutorial, take the following steps to load the MAMMALS database.

1	Select <i>Open</i> from the File menu of the Data window. The File Open window will appear.	Ele Edit New Open Close	Data - [Data Ar	Untitle nalysis	e d] Graphics Ctrl+	Vindow ×÷j	Help		- • × ! &, •
2	Double click the Data subdirectory to select it.	Select a Fi Look in: Data Grdrpt Icons Junk Report Settings Sts File <u>n</u> ame: Files of type:	le to Opt 0a70 *S0 Spreads	en sheet (*.St))	<u> </u>		Deer Cance	

44 Data Window

- 3 Double click *mammals.s0* in the list of available files.
- 4 Click the **Open** button.

This will load the MAMMALS database into the Data window.

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Look in: 🔂 🖻	ata	-		
Mammals s0 Manova 1.s0 Mantel.s0 Mds2.s0 Mds3.s0 Mlco2.s0 Odor.s0 Pass1way.s0	 Pca2.s0 Pie.s0 Pizza.s0 Plants0 Probit.S0 Qatests0 Regctus.s0 Repmeas2.s0 	Resale.s0 Rndblk1.s0 Rndblock.s0 Road.s0 Robins.s0 Roc.s0 Roc.s0 Ruspini.s0 Sales.s0	Sample.s0 Sample1.s0 Seriesa.s0 Smoking.s0 Sunspot.s0 Survival.s0 Survival.s0 Vpi.s0	
•				►
File <u>n</u> ame: Man	File name: Mammals.s0			
Files of type: Spre	eadsheet (*.S0)		Cancel	

The Data window will appear as shown to the right.

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Africa	in Elephant			
	Name	Body_Weight	Brain_Weight	<u>C4</u>
1	African Elephant	6654	5712	
2	Asian Elephant	2547	4603	
3	Giraffe	529	680	
4	Horse	521	655	
5	Cow	465	423	
6	Gorilla	207	406	
7	Pig	192	180	
8	Jaguar	100	157	
9	Man	62	1320	
10	Chimpanzee	52	440	
11	Gray Wolf	36	120	
12	Kangaroo	35	56	
13	Baboon	11	179	
14	Red Fox	4	50	
15	Cat	3	26	
16				Ţ
Variabl	e Info Sheet <u>1</u>			
1 1				

Copying and pasting data

We will now take you through the steps to copy and paste the data.

Position the cursor in row one column three (at the value ______
 5712).

	Name	Body_Weight	Brain_Weight	C4	C5	C	t
1	African Elephant	6654	5712				
2	Asian Elephant	2547	4603				
	Giraffe	529	680				
1	Horse	521	655				
ť	i Cow	465	423				
e	6 Gorilla	207	406				
7	/ Pig	192	180				
8	3 Jaguar	100	157				
	L. Man	62	1320				+
+						→	

- 2 Drag the mouse down to row six. This will select the first six rows.
- 3 Press *Ctrl-C*. This will copy the data to a temporary storage area called the *clipboard*.
- 4 Position the cursor in the cell at row one and column four.

		Name	Body_	Weight	Brain_	Weight	C4	C5	C	1
	1	African Elephant		6654		5712				
	2	Asian Elephant		2547		4603				
4	3	Giraffe		529		680				
	4	Horse		521		655				
	5	Cow		₩65		423				
	6	Gorilla		207		406				
	7	Pig		192		180				
	8	Jaguar		100		157				
	.0	Man		62		1320				+
	+								+	

	Name	Body_Weight	Brain_Weight	C4 _	C5	C	t
1	African Elephant	6654	5712				
2	Asian Elephant	2547	4603				
3	Giraffe	529	680				
4	Horse	521	655				
5	Cow	465	423				
6	Gorilla	207	406				
7	Pig	192	180				
8	Jaguar	100	157				
0	Man	62	1320				+
+						+	

5 Press *Ctrl-V* to paste the data from the clipboard. The resulting screen will appear as shown.

	Name	Body_Weight	Brain_Weight	C4	C5	C	t
1	African Elephant	6654	5712	d 5712			
2	Asian Elephant	2547	4603	4603			
3	Giraffe	529	680	680			
4	Horse	521	655	655			
5	Cow	465	423	423			
6	Gorilla	207	406	406			
7	Pig	192	180				
8	Jaguar	100	157				
<u>, 0</u>	Man	62	1320				+
+						+	

Changing column widths

Occasionally, you will want to change the width of one or more columns. This section will show you how this is accomplished. We will resize the columns headed **Body_Weight** and **Brain_Weight**.

1 Click on the column heading: *Body_Weight*.

	Name	Body _W eight	Brain_Weight	C4	C5	С	(1
1	African Elephant	6654	5712				
2	Asian Elephant	2547	4603				
3	Giraffe	529	680				
4	Horse	521	655				
5	Cow	465	423				
6	Gorilla	207	406				
7	Pig	192	180				
8	Jaguar	100	157				
.0.	Man	60	1320				
+						→	

- 2 Drag the mouse into the next column to the right and let go of the mouse button. This will select these two columns.
- 3 Move the cursor between the third and fourth columns. The cursor will change into a double-pointing arrow.
- 4 While holding down on the mouse button, drag it to the left until you are almost to the next cell border.
- 5 Let go of the mouse button.

The resulting display will appear like this.

6 Reverse this process to reset these columns to their original width.

1 African Elephant 6654 5712 2 Asian Elephant 2547 4603 3 Giraffe 529 680 4 Horse 521 655 5 Cow 465 423	(Ť
2 Asian Elephant 2547 4603 3 Giraffe 529 680 4 Horse 521 655 5 Cow 465 423	
3 Giraffe 529 680 4 Horse 521 655 5 Cow 465 423	
4 Horse 521 655 5 Cow 465 423	
5 Cow 465 423	
6 Gorilla 207 406	
7 Pig 192 180	
8 Jaguar 100 157	
.0. Man 69 1990	+
+ ·	

		Name	Body_Weight	B rain_Weig nt ←	£4	C5	+
Ī	1	African Elephant	6654	5712			
	2	Asian Elephant	2547	4603			
	3	Giraffe	529	680			
	4	Horse	521	655			
Ī	5	Cow	465	423			
	6	Gorilla	207	406			
Ī	7	Pig	192	180			
	8	Jaguar	100	157			
Į.	_, 0	Man	62	1300			+
	+					→	

	Name	Body_Weight	Braii	n_Weight	C4	C5	С	t
1	African Elephant	6654	\$	5712				
2	Asian Elephant	2547		4603				
3	Giraffe	529		680				
4	Horse	521		655				
5	Cow	465		423				
6	Gorilla	207		406				
7	Pig	192		180				
8	Jaguar	100		157				
.0_	Man	60		1300				-
+							+	

	Name	B(B)	C4	C5	C6	C7	C8	t
1	African Elephant	44 V4						
2	Asian Elephant	411 H I.						
3	Giraffe	####						
4	Horse	444						
5	Cow	####						
6	Gorilla	411 II I.						
7	Pig	####						
8	Jaguar	444						
.0	Man	ннні						+
+							+	

CHAPTER 8

Procedure Window

About this chapter

All **NCSS** procedures (e.g., t-test, multiple regression, or scatterplot) are controlled by a procedure window. The Procedure window contains all the settings, options, and parameters that control a particular procedure. These options are separated into groups called *panels*. A particular panel is viewed by pressing the corresponding *panel tab* that appears just below the toolbar near the top of the window.

The current values of all options available for a procedure are referred to as a *template*. By creating and saving template files, you can tailor each procedure to your own specific needs.

Below is a picture of the Descriptive Statistics template. This chapter presents a brief tutorial of how to operate the Procedure window.

Navigating a procedure window

This section will show you how to move around a procedure window. The window is made up of two or more panels (in this example there are five panels: Variables, Reports, Prob Plot, Histogram, and Template). You control a procedure by changing the settings on each of these panels. Hence, navigating a procedure window simply means that you move from panel to panel.

1 From the *Analysis* menu, select *Descriptive Statistics*, then *Descriptive Stats*.

The Descriptive Statistics procedure window will appear.

2 Press the **Prob Plot** tab to display the Prob Plot panel. /

Descriptive Statistics	_ 🗆 ×
<u>File Run Analysis Graphics Window H</u> elp	
▶	🕙 🤋 📍
Variables Reports Prob Plot Histogram Template	
Variables:	
Exponent: Additive Constant:	
None	
Group 1 Variable:	
Group 2 Variable:	
Group 3 Variable: Frequency Variable:	
T Filter Active	
[

48 Procedure Window

3 Press the *Variables* tab to redisplay the Variables tab.

Descriptive Sta Eile Run Analysis	ttistics Graphics Window Help ■ I III SI	
▲ ⊻ariables Rep Plot Style File: Default	Image: Control of the second secon	
Label: Y {Y}	Minimum: Maximum: Tick Marks: Ref. Numbers Ref. Numbers Ref. Numbers	8
Y Major Ticks: Y I 5 Y Grid Lines	Minor Ticks: XMajor Ticks: XMinor Ticks: 5 V 4 V C XGrid Lines	
Symbol:		

Notice that many of the option boxes have small buttons on their right. These buttons may be used to activate a separate input window. For example, if you press the button to the right of the Variables box, the Variable Selection window will appear. This window will help you select the variables to be used.

🛱 Descriptive Statistics	_ 🗆 X
<u>Eite Bun A</u> nalysis <u>G</u> raphics <u>W</u> indow <u>H</u> elp	
▶	?
Variables Reports Prob Plot Histogram Iemplate	
Variables:	
1	
Exponent: Additive Constant:	
None	
Group 1 Variable: Group 4 Variable:	
<u><u><u></u></u></u>	
Group 2 Variable: Group 5 Variable:	
<u>±</u>	
Group 3 Variable: Frequency Variable:	
<u> </u>	
☐ Filter Active	

Changing an option

Suppose you want to change the Exponent option from None to 3.

1 Press the drop-down button on the right of the *Exponent* box.

This will activate the drop-down menu.

2 Move the scroll bar thumb down until the 3.0 appears.

	Descriptive Statistics	_ 🗆 ×
	<u>File Run Analysis Graphics Window H</u> elp	
	▶	👻 🤋 🍞
-	Yariables Reports Prob Plot Histogram Iemplate Variables: 1 ▶ ▶ Image: State of the sta	Each value is raised to this exponent. Fractional exponents REOUIRE positive data.
	-1.5 -1.5 -1.0 -0.5 -1/3 Group 5 Variable: ▲ Frequency Variable: ▲ ▲	
	Filter Active	
	File Bun Analysis Granhics Window Help	
		👻 🤋 🍞
	Variables Reports Prob Plot Histogram Iemplate	Each value is raised to this

- 3 Move the cursor down so that the **3.0** is highlighted.
- 4 Select the **3.0** by clicking it (or by pressing the Enter key while the 3.0 is highlighted).

Another way to change this option is to select it and press 3. The program searches through the options for the first item that begins with a 3.

Descriptive Statistics	_ 🗆 ×
<u>File Run Analysis Graphics Window H</u> elp	
	ど 🤋 📍
⊻ariables Reports Prob Plot Histogram <u>T</u> emplate	Each value is raised to this
Variables:	exponent. Fractional exponents REQUIRE
Exponent Additive Constant	positive data.
-1/3 LOG10 1/3 0.5 4.5	
1.5 2.0 2.5	
Group 3 Variable: Frequency Variable:	
Filter Active	

Notes on modifying options

Many of the option boxes have alternative methods of entering data. For example, when you need to select a variable, you can type the variable name directly in the box or you can double click on the box to bring up a variable selection window.

Entering text

When an option needs text (such as the title of a graph), type the text directly into the box. Note that while you are typing, if you decide to revert back to the original text, you can hit the Escape (Esc) key.

Selecting variables

When you need to specify variables, you can type their names directly into the box, you can enter their numbers directly into the box, or you can activate the variable selection window.

1 Double click in the *Variables* box.

This will display the variable selection window. You can select the variables of interest and press the Ok button when you are finished.

Press the *Ctrl* key when you want to select several, noncontiguous, variables.

As you select variables in the Variable Selection List box, they will appear in the Variables Selected box at the bottom.

It may be convenient to specify variables by number rather than by name. For example, when you use numbers, you can use the same settings on several databases, even though the variables have different names.

The scriptive Statistics	
<u>File Run Analysis G</u> raphics <u>W</u> i	ndow Help
	2 Sm X X X # L L L 2 ? ?
⊻ariables Reports Pro	b Plot Histogram Template
Variables:	
¹¹ /	<u>∧</u> <u>∎</u> ⊻
Exponent	Additive Constant:
3,0 -	
¢iroup 1 ∨ariable:	Group 4 Variable:
<u> </u>	<u>±</u>
/ Group 2 Variable:	Group 5 Variable:
/ <u>+</u>	<u>±</u>
/ Group 3 Variable:	Frequency Variable:
<u>+</u>	<u>±</u>
Filter Active	

Variables				
-Variable Selection List-				·
Name C10	C19	C28		Ok
Body_WeighC11 Brain_WeighC12	C20 C21	C29 C30		Cancel
C4 C13	C22	C31		
C6 C15	C24	C33		Help
C7 C16 C8 C17	C25 C26	C34 C35		
C9 C18	C27	C36		
•			►	
Variables Selected				
1			<u> </u>	
			7	
Select All Clea	r 🛛 🗆 Sto	ire as Numhi	ers	
		ine de Marrie	0.0	

Saving a template

Once you have filled out a procedure, you may want to save your choices so that you do not have to reset them again the next time you use the procedure. This is accomplished using the Template panel.

In this example, we will save the current settings to a file called TUTOR1.

1 Press the *Template* tab to display the Template panel.

Descriptive Statistics	
<u>File Bun Analysis G</u> raphics <u>Window H</u> elp	
Yariables Reports Prob Plot Histogram →Template	
Variables:	
Exponent Additive Constant:	
3.0	
Group 1 Variable: Group 4 Variable:	
<u><u><u></u></u></u>	
Group 2 Variable: Group 5 Variable:	
Group 3 Variable: Frequency Variable:	
<u>±</u>	
Filter Active	
L	

		Descriptive Statistics
2	Enter <i>Tutor1</i> in the File Name box. This is the name	Eile Bun Analysis Graphics Window Help D
	where the template is stored.	<u>V</u> ariables Reports Prob Plot Histogram Template Eile Name Template Directory
3	Enter an identifying phrase	Tutor1 d:\0a70\settings*.24
	in the Template Id box at the	Template Files Template Id's
	bottom of the screen.	Example1 Example 1 - SAMPLE
4	Press the Save Template	
	button to store the template	
	file.	
	\backslash	Load Template Save Template
	· · · · · · · · · · · · · · · · · · ·	
		This is the example for the Getting Started booklet.

Note that when you supply the template file name, you do not enter a three-character extension. **NCSS** adds the appropriate extension. This extension may be determined by looking at the Template Directory. In our example, the extension is the number 24.

You should also note that you can delete these files using your Windows Explorer program.

Loading a template file

In this example, we will load the previously saved Tutor1 template file.

- 1 Select **TUTOR1** from the available template files.
- 2 Press the *Load Template* button.

The settings are reset to how they were when Tutor1 was saved.

Descriptive Statistics	3	_ 🗆 🗙
File Run Analysis Graphic	s <u>W</u> indow <u>H</u> elp	
	I 🕑 🙋 😪 🛪 🖋 🎢 🏨 🗷	👻 🤋
⊻ariables Reports	Prob Plot Histogram <u>T</u> emplate	
<u>F</u> ile Name Tutor1	Template Directory d:\0a70\settings*.24	
Template Files	Template Id's	
default Example1	default Example 1 - SAMPLE This is the example for the Gatting Starter	
Load Template	Save Template	
This is the example for the Gettin	g Started booklet.	
•	-	

The default template

Whenever you close a procedure window, the current settings are saved in a template file named Default. When a procedure is loaded, **NCSS** checks to determine if the template file Default exists. If such a file exists, it is automatically loaded after the procedure window is loaded. Hence, the current settings of each procedure window are preserved between sessions. Because of this, you should avoid using Default as a template file name.

CHAPTER 9

Output Window

About this chapter

NCSS sends all statistics and graphics output to its built-in word processor from where they can be viewed, edited, printed, or saved. Reports and graphs are saved in rich text format (RTF). Since RTF is a standard Windows document transfer format, these files may be loaded directly into your word processor for further processing. You can also cut data from the report and paste it into an **NCSS** datasheet for further analysis. This chapter covers the basics of our built-in word processor.

This chapter will continue the analysis of the brain weight data that was begun in Chapter 3. If you have not already done so, run the Descriptive Statistics reports as described in Chapter 4. Our analysis here will pick up where that chapter ended.

Viewing the output

The output of the Descriptive Statistics program is shown below. Usually, you will find it useful to put the output window into full-screen mode.

1 Double click on the Output title bar. - CSS Output File Edit View Format Window Help This will put the word processor 🥐 😅 🚇 🍯 🐰 🖻 🛍 🛤 🗠 F 🔳 🚥 🚥 🕒 📼 🧱 🥔 🗙 🛷 🎢 🚟 📠 into full-screen mode. 🛡 Output Descriptive St Page 2 Double click on the document title D:\0A70\DATA\Mammals.S0 Database Time/Date 11:26:17 06-17-1997 bar. Summary Section of Body_Weight This will put the document in full-Standard Standard screen mode also. Count Mean Deviation Error 452.1798 15 761.2 1751.285 Counts Section of Body_Weight Missing Distinct Sum of Rows Values Frequencies Values 15 15 15 Means Section of Body_Weight Geometric Parameter Mean Median Mean Value 761.2 100 110.7553 CHA En 150 1700 Page 1/3 Line Col

NCSS Output - [Output] _ 🗆 × The screen will look _ 8 × <u>E</u>dit similar to this. Note ╸ຬฃ*る*҂ѷҞ҄╬ѩ∽ **ӷ**ฃ━━ ๏๏ฃ<u>ฃ</u>ҳ҂೫҄Ӝ҄҄ӝѩ⋈⊻座 that the actual size • **Descriptive Statistics Report** of your screen Page Database Time/Date D:\0A70\DATA\Mammals.S0 11:26:17 06-17-1997 depends on the resolution of your Summary Section of Body_Weight monitor, so it will Standard Standard Count Mean Deviation 1751.285 Error 452.1798 Minimum Maximum Range 6651 vary. 761.2 6654 Counts Section of Body_Weight Missing Values Sum of Distinct Total Adjusted Rows Frequencies Values Sum Sum Squares Sum Squares 11418 5.162936E+07 15 15 4.293798E+07 Means Section of Body_Weight Geometric Harmonic Median Parameter Mean Mean 110.7553 **Mean** 18.92759 Sum Mode Value 761.2 452.1798 100 11418 6782.697 -3129.438 Std Error 95% LCL -208.6292 35 95% UCL 1731.029 521 25965.44 T-Value 1.6834 0.114454 Drob Loval • Page 1/3 Line 1 Col B NCSS Output - [Output] - 🗆 × Select Show All ♦ <u>F</u>ile <u>E</u>dit <u>View</u> F<u>o</u>r _ 8 × 3 🍷 😅 🔛 🍯 <u>R</u>uler from the View Eormat Toolbar Descriptive Statistics Report • ✓ Status Bar menu. Pa Show <u>All</u> Da <u>H</u>ide All \0A70\DATA\Mammals.S0 Time/Date 1:26:17 06-17-1997 Summary Section of Body_Weight Standard Standard Count Mean Deviation Error 452.1798 Minimum Maximum Range 15 761.2 1751.285 3 6654 6651 Counts Section of Body_Weight Missing Values Distinct Adjusted Sum Squares Sum of Total Frequencies Sum Squares Rows Values Sum 15 11418 5.162936E+07 4.293798E+07 Ω Means Section of Body_Weight Geometric Harmonic Mean 110.7553 Parameter Mean Median Sum Mode Mean Value Std Error 761.2 452.1798 18.92759 11418 6782.697 100 3 95% LCL -208.6292 -3129.438 35 521 25965 44 95% LICE 1731.029 1.6834 T-Value Drob Lovo 4 Page 1/3 Line 1 Col

The screen will look similar to this.

Notice the standard word processing ruler, tab bar, and button bar. These will aid you in editing your document.

NCS	S Output - [O	utput] net Window Holp					
♥ <u>_</u>	2 dii view i <u>b</u> ii 2 4 5 6		-		ñ 🎬 🖪 🙋 🛃	<u>*</u>	
"It Arial	•	10 🗸 📰 🗐		% x ² x ₂ = =	= T a		-
<u> </u>	ll1	2		······································	······ ¹⁵ ···	······································	<u></u>
				Descriptive Sta	atistics Report		
	Page Database Time/Date	1 D:\0A70\D 11:26:17 0	ATA\Mammals. 6-17-1997	S0			
	Summary Se	ction of Body_We	eight Standard	Standard			
	Count 15	Mean 761.2	Deviation 1751.285	Error 452.1798	Minimum 3	Maximum 6654	Range 6651
	Counts Secti	on of Body_Weig	ht				
	Rows 15	Sum of Frequencies 15	Missing Values 0	Distinct Values 15	Sum 11418	Total Sum Squares 5.162936E+07	Adjusted Sum Squares 4.293798E+07



This will position the report so that the desired section title is showing.

🔶 <u>F</u> ile	<u>E</u> dit <u>V</u> iew F <u>o</u> rm	at <u>W</u> indow <u>H</u> el	p				
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Tr Arial	• 1		B I U AB	£ x ² × ₂ = =	= T a		
<u> </u>	<u></u> ¹			4	· · · · · · · · · · · · · · · · · · ·		· • • • • • • • • • • • • • • • • • • •
	Skewness an	L Kurtosis Seci	tion of Body. We	ight	L	L	L
			lion of Douy_no	- grit		Coefficient	Coefficient
	Parameter	Skewness	Kurtosis	Fisher's g1	Fisher's g2	of Variation	of Dispersion
	Value	2.847638	9.913074	3.174323	10.46493	2.300689	7.274667
	Std Error	1.362987	8.774837			0.5441776	
	Trimmed Sect	ion of Body_W	eight				
		5%	ັ10%	15%	25%	35%	45%
	Parameter	Trimmed	Trimmed	Trimmed	Trimmed	Trimmed	Trimmed
	Trim-Mean	475.9445	290.4583	197.619	121.8333		
	Trim-Std Dev	1108.675	530.6625	201.6667	71.86818		
	Count	13	12	10	4		
	Mean-Deviation Section of Body_Weight						
	Parameter	X-Mean	X-Median	(X-Mean)^2	(X-Mean)^3	(X-Mean)^4	
•							
						Page 1/3 L	ine 51 Col 1.

At this point, you

would scroll down through your output, perusing the results. Once you determine that you want to retain your results, you have four choices:

- 1 Print the document.
- 2 Save the document to a file.
- 3 Add the document to the log. (The log holds the output from several analyses in one file.)
- 4 Copy the report to a temporary holding area (the Windows clipboard) and paste it into another application.

Note that you cannot just leave the output in the current window if you want to keep it because it will be replaced by the next analysis that you run.

Printing the output

Before printing the report, you should scroll through it to determine if there are any portions that you want to delete before printing. To print the report, take the following steps.



Saving the output to a file

You can save the output to a file. The report is saved in rich text format (RTF) which is a standard document interchange format. This format may be read into commercial word processors such as Word and Word Perfect. This will allow you to export the reports to your favorite word processor.

Take the following steps to save the output to a file.

1	Select Save As from	# NCSS Outnut - I	Output]					
	the File menu.	◆ <u>File</u> <u>E</u> dit <u>V</u> iew F	ormat <u>W</u> indow <u>H</u> elp					B_×
		New Log	∽ <u>F</u> ¶	•••• 🗈 🚥	🔲 🙋 🗵 🖉 🕅	ñ 🚟 🖪 😟 🗹	*	
	This will bring up	Dipen (Ctrl+O	B I U A	86 x ² x ₂ = =	= 1		
	the Save File As	Upe <u>n</u> Log	l ²		······································			<u></u>
	dialog box. Note that	Add Output to Log Save As	Ctrl+S		Descriptive Sta	tistics Report		<u> </u>
	this dialog box may	Print	Otrl+P 1					
	look different in	Close	D:\0A70\D 11:26:17 0	0ATA\Mammals. 06-17-1997	.S0			
	Windows 05 bot the	<u>E</u> xit	of Body, W	eight				
	windows 95, but the	Junnary	Section of Body_W	Standard	Standard			
	basic functionality	Count 15	Mean 761.2	Deviation 1751.285	Error 452.1798	Minimum 3	Maximum 6654	Range 6651
	will be the same.	0				-		
		Counts Se	Sum of	Missing	Distinct		Total	Adjusted
		Rows 15	Frequencies 15	Values 0	Values 15	Sum 11418	Sum Squares 5.162936E+07	Sum Squares 4.293798E+07
2	Enter a file name							
-	such as	Save File A	s					? ×
	myroport rtf	Sevo in:	Benort			_	1	m
		ouve <u>i</u> n.					[6=6=]	
	Note that the file	2prop.RTF	🛯 🕙 nonl	lin.RTF				
	name must end with	🚰 3d.RTF	🕎 pare	eto.RTF				
	the extension "rtf"	attchart.RT	F 🖺 Prot	oPlot.RTF				
	the extension fit.	bars.rtt	™]surfa ™)⊤⊤-	ace.ntt				
3	Click Save to save		ອງເມຍ ເສັນແກ່ນ	suru or DTE				
	your report.	Tactor BTE		01.1111				
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		rile <u>n</u> ame:	Гмунероп.н	NIF				<u>b</u> ave
		Save as type:	Rich Text*.	RTF			-	Canad
			1	· · · ·				Cancer

Saving the output to the log document

An analysis of a set of data usually requires the running of several statistical procedures. The *log* document provides a convenient way to store the output from several procedures together in one file. When you have a report or graph that you want to keep, copy it from the output document to the log document.

The log document provides four main word processing functions: loading, editing, printing, and saving. When you load a file into the log document, you can add new output to it. In this way, you can record your work on a project in a single file, even though your work on that project is spread out over several days.

Take the following steps to add the current output to the log document.



The log document resides in memory until you store it. To store the log document, take the following steps:

- 1 Select Log from the Window menu so that the log document is active.
- 2 Select Save As from the File menu and complete the Save File As dialog.

Warning: The log document is not automatically stored. You must store the contents of the log document to a file before exiting **NCSS**.

CHAPTER 10

Filters

About this chapter

This chapter explains how to use *filters* to limit which rows (observations) are used by a particular procedure and which are skipped. For example, you might want to limit an analysis to those weighing over 200 pounds. You would use a filter to accomplish this.

Setting up a filter

Using the MAMMALS database (see Chapter 3), we will setup up a filter so that only those animals with a body weight greater than 200 kilograms are used in the statistical calculations.

If the MAMMALS database is not currently loaded, select Open from the File menu, move to the \NCSS97\DATA subdirectory, and double click on the file MAMMALS.S0. Your display should appear as follows.

1 Select <i>Filter</i> from the Data menu.	Image: Second state of the second s
This brings up the Filter template.	52 Filter N Enter Transform A Recalc Qurrent Becalc All 529 Granner 529 Variable Info Sheet1 2 10
2 Check the Filter System Active box.	Filtor Image: Sector File Statements File System Active Keep Row It: If at least one statement is true (OF) Filter Statements: C1>=0 Comparison Fuzz Factor: 1E-14

3	Enter the filter condition, Body_Weight>200, in the Filter Statements box.	Filter Image: Second secon
4	Press the <i>Run</i> button to / activate the filter.	Comparison Fuzz Factor:
5	The Filter activated box will be displayed. Press OK .	NCSS 97.0 X The Filter has been turned ON.

The filter is now setup. Notice that the Filter button on the both the Data and Filter toolbars has now ______ changed to a green funnel with the word On below it. This is a reminder that the filter system is active.

# Filter	_ 🗆 ×
▁ <mark>▁▁ਫ਼ੑੑ</mark> ੑ <u>ੑੑ</u> <u>ੑ</u>	
<u>Statements</u> <u>T</u> emplate	
Filter System Active Keep Row If: If at least one statement is true (OR)	
Filter Statements:	
Body_Weight>200	
Comparison Fuzz Factor:	
1E-14	
1	

We will now show you how to use it in a procedure by obtaining the mean and standard deviation of the filtered database.

8 Press the Descriptive Statistics 🗃 Filter _ 🗆 🗙 <u>File</u> <u>R</u>un <u>Analysis</u> <u>G</u>raphics <u>W</u>indow <u>H</u>elp button on the toolbar. 🕨 🗅 🖻 🖫 🔲 🛃 💆 🤝 🗙 🖋 🎢 🚟 🖪 👳 🖉 💡 🍞 Template Statements Keep Row If: Filter System Active If at least one statement is true (OR) Filter Statements C1>=0 Comparison Fuzz Factor 1E-14 -Enter Body_Weight in the Variables 9 Descriptive Statistics _ 🗆 🗙 Window Help <u>File Run Analysis Graphics</u> box. - 💷 🛃 🕿 🛪 💥 📅 🏪 🖻 🗷 💌 🤋 🎗 Yariables Reports Prob Plot Histogram Template 10 Check the Filter Active box. This indicates that you want to use the Variables: ^ **±** Body_Weight currently defined filter with this analysis. Additive Constant: Exponent None -Group 1 Variable Group 4 Variable Ŧ Ŧ Group 2 Variable: Group 5 Variable: 11 Press the Run button to run the **₹** Ŧ procedure. Group 3 Variable: Frequency Variable: **₹** Ŧ Filter Active This is the example for the Getting Started booklet.

12 Finally, view the output.

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•			↑ Descriptive Stat	tistics Report	-		
Page Database Time/Date Filter	1 D:\0A70\D/ 13:25:22 06 Body_Weig	ATA\Mammals. 5-17-1997 ght>200	SO				
Summary Se	ction of Body_We	ight Otara dand	Otom dowd				
Count ♠ ⁶	Mean 1820.5	Deviation 2517.458	Standard Error 1027.748	Minimum 207	Maximum 6654	Range 6447	
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Count	6		6	6		1	
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Parameter Value Std Error 95% LCL 95% UCL	Variance 6337592 3972547 2469352 3.812262E+07	Deviation 2517.458 1115.814 1571.417 6174.351	Std Dev 2645.686	of Mean 1027.748 455.5293 641.5283 2520.668	Range 3173.25	Range 6447	
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Parameter Value Std Error	Skewness 1.404337 1.066404	Kurtosis 3.357441 3.434566	Fisher's g1 1.922968	Fisher's g2 3.542537	of Variation 1.382838 0.3615386	of Dispersio 2.710159	
Trimmed Sec	tion of Body_Wei	ght					
	-						

Notice that although fifteen rows were processed, only six rows were actually used in the computations.

Disabling the filter

When you are finished using a filter, you can bring up the Filter procedure window, click the Filter System Active button so that it is not checked, and press the Run button to run the filter procedure. This will deactivate the filter.

Writing Transformations

About this chapter

The basics of entering transformations were covered in Chapter 3. This chapter gives examples of how to write more advanced transformations.

Recoding

Background

Data *recoding* refers to replacing one set of values with another. For example, suppose you have each individual's age stored in a variable called AGE. Suppose that you want to create a new variable called AGEGROUP that classifies each individual into one of four age groups according to the following rule:

AGE Values	AGEGROUP Value
1 to 12	1
13 to 19	2
20 to 29	3
30 and above	4

Example of recode

RECODE(Age; (1:12 = 1) (13:19 = 2) (20:29 = 3) (Else = 4))

Notice the basic syntax of this function. The variable being recoding is given first (here Age). Next, a set of statements that define the recoding are given.

Example result

	Age	AgeGroup	C3	C4	C5
1	23	3			
2	15	2			
3	5	1			
4	33	4			
5	19	2			
6	46	4			
7	22	3			
8					
~					

Basic indicator

Background

Indicator transformations are used in logic (if - then) situations. An indicator function evaluates to one if the condition is true or to zero if the condition is false. The basic syntax is two arguments between parentheses separated by a logic operator. The possible logic operators are <, >, <=, >=, <>, and =.

Example indicator

(AGE > 20)

If AGE is greater than 20, the result will be a one. Otherwise, the result will be a zero.

Example Result

	Age	Indicator	C3	C4	C5
1	23	1			
2	15	0			
3	5	0			
4	33	1			
5	19	0			
6	46	1			
7	22	1			
8					
0					

Compound indicators

Background

Since indicator functions evaluate to a numeric value (either 0 or 1), they may be combined with other functions--including other indicator functions. When combining several indicators, the logical AND is achieved by multiplying the indicators and the logical OR is achieved by adding.

Example of compound indicators

(AGE > 20)*(AGE<=40)

If age is greater than 20 *and* less than or equal to 40, the result will be a one. Otherwise, the result will be a zero.

Example results

	Age	Indicator	C3	C4	C5
1	23	1			
2	15	0			
3	5	0			
4	33	1			
5	19	0			
6	46	0			
7	22	1			
8					
0					

indicators for if - then

Background

Indicator functions may be used in place of *if* - *then* statements. The following examples show how this is done.

Example 1

If Age is less than 20 set AdjIncome to 5000. Otherwise, set AdjIncome equal to Income.

Example 1 transformation

(Age < 20)*5000+(Age>=20)*Income

Note that the indicator functions used here are opposites. When (Age<20) is 0, (Age>=0) will be 1.

Example 1 results

	Age	Income	AdjIncome	C4	C5
1	23	22000	22000		
2	15	5500	5000		
3	5	100	5000		
4	33	35400	35400		
5	19	9000	5000		
6	46	54000	54000		
7	22	6000	6000		
8					
0					

It may be helpful to look at how this expression works on the first two rows.

Calculation for the first row:

(23<20)*5000+(23>=20)*22000 = 0(5000) + 1(22000) = 22000

Calculation for the second row:

(15<20)*5000+(15>=20)*22000 = 1(5000) + 0(5500) = 5000

Example 2

If Age is less than 20 set AdjIncome equal to Income + 1000. Otherwise, set AdjIncome to Income + 2000.

Example 2 transformation

(Age < 20)*(Income+1000)+(Age>=20)*(Income+2000)

Example 2 results

	Age	Income	AdjIncome	C4	C5
1	23	22000	24000		
2	15	5500	6500		
3	5	100	1100		
4	33	35400	37400		
5	19	9000	10000		
6	46	54000	56000		
7	22	6000	8000		
8					
0					

It may be helpful to look at how this expression works on the first two rows.

Calculation for the first row:

 $(23<20)^{*}(22000+1000)+(23>=20)^{*}(22000+2000) = 0(23000) + 1(24000) = 24000$

Calculation for the second row:

 $(15<20)^{*}(5500+1000)+(15>=20)^{*}(5500+2000) = 1(6500) + 0(7500) = 6500$

CHAPTER 12

Importing Data

About this chapter

This chapter presents an example of importing data from a comma delimited ASCII (text) file into **NCSS**.

The ASCII file

Following is a set of data contained in the file ASCII.TXT in your \NCSS97\DATA subdirectory. We will now go through the steps necessary to import the data from this file.

Bob,2,4,22,5 Judy,5,44,22,4 Sam,1,32,42,9 Mary,4,1,22,23 John,19,22,44,1 Linda,3,11,2,14

How to import ASCII.TXT

1	Press the New Database button on the toolbar.	Image: NCSS Data - [Untitled] X File Edit Data Analysis Graphics Window Help							
2	It is necessary to clear the previous database								
	Otherwise, the imported data would be added to it.	1	C1	C2	C3	C4	C5	C6	C_
	A dialog box, entitled Create a New Data File, will appear.	3 4 5							
	Indicate that you want a Spreadsheet-type data file since this is a small set of data.	6 Variable Info 1							
	Since this is the default, just click <i>Ok</i>		a New Da Select Type preadsheet (S atabase (S0Z	t a File of Data File — <u>Ofile)</u> file)		- Step <u>2</u> Cont ▶ <u>Q</u> k	inue	elp	
	Select Import non the rile	😸 NCSS Data - [Untitled]							
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	menu.	<u>File</u> Edit <u>D</u> ata <u>A</u> nalysis <u>G</u> raphics <u>W</u> indo	ow <u>H</u> elp						
			÷ 🔲 🔍 🗾 🧕 🌌 🐄 🗶 🖋 🦉						
		Close]						
		Add a Sheet	C4 C5 C6 C -						
	×	Import							
		Remove <u>L</u> ast Sheet							
4	Select ASCII Delimited *.TXT	🗟 Import a File	×						
	from the Select the File Type	-Sten 1. Select the File							
	selection box.	Type of File:	Select the type of file to						
			from the list.						
		ASCII Delimited *.TXT							
		ASCII Fixed *.TXT BMDP Classic * POB							
		Crunch *.CSC							
		DBase *.DBF Excel * XI S							
		Gauss *.DAT							
		Rows:							
		Help	Distribute						
			E DEVICTUS DET						
5	Press the Select a File to	S. Import a File							
5	Press the <i>Select a File to</i> <i>Import</i> button to specify the file	Step 1 Select the File	Specify the name of the						
5	Press the <i>Select a File to Import</i> button to specify the file name.	Step 1 Select the File	Specify the name of the file to be imported. Note						
5	Press the <i>Select a File to</i> <i>Import</i> button to specify the file name.	Step 1 Select the File Type of File: ASCII Delimited *.TXT	Specify the name of the file to be imported. Note that the file name extension must						
5	Press the <i>Select a File to Import</i> button to specify the file name.	Step 1 Select the File Type of File: ASCII Delimited *.TXT Current File Name:	Specify the name of the file to be imported. Note that the file name extension must correspond to the type of						
5	Press the Select a File to Import button to specify the file name.	Step 1 Select the File Type of File: ASCII Delimited *.TXT Current File Name:	Specify the name of the file to be imported. Note that the file name extension must correspond to the type of file specified above.						
5	Press the <i>Select a File to Import</i> button to specify the file name.	Step 1 Select the File Type of File: ASCII Delimited *.TXT Current File Name:	Specify the name of the file to be imported. Note that the file name extension must correspond to the type of file specified above.						
5	Press the Select a File to Import button to specify the file name.	Step 1 Select the File Type of File: ASCII Delimited *.TXT Current File Name:	Specify the name of the file to be imported. Note that the file name extension must correspond to the type of file specified above.						
5	Press the <i>Select a File to</i> <i>Import</i> button to specify the file name.	Select a File to Import	Specify the name of the file to be imported. Note that the file name extension must correspond to the type of file specified above.						
5	Press the <i>Select a File to Import</i> button to specify the file name.		Specify the name of the file to be imported. Note that the file name extension must correspond to the type of file specified above.						
5	Press the <i>Select a File to Import</i> button to specify the file name.	Select a File to Import Rows: Names Row: Lines/CAIL	Specify the name of the file to be imported. Note that the file name extension must correspond to the type of file specified above.						
5	Press the <i>Select a File to Import</i> button to specify the file name.	Select a File to Import Rows: Names Row: Lines/G All None 1	Specify the name of the file to be imported. Note that the file name extension must correspond to the type of file specified above.						
5	Press the Select a File to Import button to specify the file name.	Step 1 Select the File Type of File: ASCII Delimited *.TXT Current File Name: Select a File to Import Rows: Names Row: Lines/C All	Specify the name of the file to be imported. Note that the file name extension must correspond to the type of file specified above.						
5	Press the <i>Select a File to Import</i> button to specify the file name.		Specify the name of the file to be imported. Note that the file name extension must correspond to the type of file specified above. Obs'n: Previous Next 						



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BOD							[_
	C1	C2	C3	C4	C5	C6	C7	C8	
1	Bob	2	4	22	5				
2	Judy	5	44	22	4				
3	Sam	1	32	42	9				
4	Mary	4	1	22	23				
5	John	19	22	44	1				
6	Linda	3	11	2	14				
7									
8									
9									
10									
11									
12									-
Variab	le Info She	eet <u>1</u>							
1 1									

The imported data will appear in the Data window.

Note that the imported database resides in your computer's memory, not on the hard disk. If you want to make a permanent copy of your data, you should select *Save As* from the *File* menu and save a copy of the imported data to your hard disk.

CHAPTER 13

Value Labels

About this chapter

Value Labels provide a mechanism to attach labels to coded data. For example, in a questionnaire you might have questions whose responses fall along a Likert scale. Perhaps you have entered the data as numeric values from 1 to 5. Value labels may be attached to the responses so that the 1 shows up on your printout as "Strongly Agree" and 5 is displayed as "Strongly Disagree."

This chapter will provide you with a step by step outline of how to use value labels. The data for this example come from a four-item questionnaire that was given to twenty people as part of a political poll. The first three questions contain demographic information about the individual. The fourth question is their opinion about a hot political issue. You will find these data in the POLITIC database. The data were coded numerically for easy data entry as follows:

POLITIC Database

AgeGroup

- 1 = 25 and under
- 2 = 26 to 34
- 3 = 35 to 55
- 4 = 56 and above

State

- 1 = California
- 2 = Virginia
- 3 = Texas
- 4 = Other

Party

- $\tilde{1} = Democrat$
- 2 = Republican
- 3 = Other

Issue

- 1 =Strongly agree
- 2 = Agree
- 3 = Neutral
- 4 = Disagree
- 5 = Strongly disagree

	AgeGroup	State	Party	lssue	C5
1	1	1	3	4	
2	4	2	2	2	
3	3	2	1	3	
4	2	1	1	4	
5	2	4	2	5	
6	4	4	2	4	
7	2	3	1	1	
8	4	1	3	2	
9	2	2	2	1	
10	2	1	1	3	
11	1	4	3	2	
12	1	3	2	2	
13	3	3	2	1	
14	2	2	1	4	
15	3	1	2	5	
16	1	2	1	5	
17	4	2	3	2	
18	4	1	3	1	
19	2	4	1	1	
20	3	4	2	3	
21					

Adding the value labels

The next step is to add the value labels to the database. This is done by entering the values and corresponding labels in adjacent columns of the database. Leaving space for additional response variables, we put the value labels in columns 15 through 22. C15 contains the values of AgeGroup, C17 contains the values of State, and so on.

Note that we have resized the column widths to make the display easier to read (C15, C17, C19, and C21 are narrower than usual).

Although in this example we are constructing value labels for each variable, you do not have to do this. You can label as many or as few variables as you like.

	C14	C15	C16	C17	C18	C19	C20	C21	C22	C23
1		1	25 and under	1	California	1	Democrat	1	Strongly agree	
2		2	26 to 34	2	Virginia	2	Republicar	2	Agree	
3		3	35 to 55	3	Texas	3	Other	3	Neutral	
4		4	56 and above	4	Other			4	Disagree	
5								5	Strongly disagree	
6										
7										

Attaching the value labels to the variables

The final step is to attach the value-label columns to the appropriate variables. This is accomplished as follows:

1 Click the Variable Info tab.

I		C14	C15	C16	C17	C18	C19	C20	C21	C22	C23	t
I	1		1	25 and under	1	California	1	Democrat	1	Strongly agree		
I	2		2	26 to 34	2	Virginia	2	Republicar	2	Agree		
I	3		3	35 to 55	3	Texas	3	Other	3	Neutral		
I	4		4	56 and above	4	Other			4	Disagree		
	5								5	Strongly disagree		
	6											
I	7											
N	8											
ľ	9											Ŧ
	4										+	
l	Variable	e Info 🕺 Shee	n <u>1</u> /									_

- 2 Use the *vertical scroll bar* or the *Page Up* key to reposition the view to the top of the Variable Info datasheet.
- 3 Click in the first cell under *Value Labels* to set the spreadsheet cursor there.

	Name	Label	Transformation	Format	Data Type	Value Label 🕈
1	AgeGroup					
2	State					
3	Party					
4	Issue					
5	C5					
6	C6					
1	C7					
8	C8					
9	C9					+
+						→
Variat	ole Info She	et <u>1</u>				

4	Type C15. Press Enter. Type C17.		S Data - [lit Data Ar ➡₽₽_&	D:\0A7 halysis	O\DATA\Politic.s Graphics Window <u>F</u> AN ∽ F ∓≐ ■	:0] _telp] _0	D 2 77, V	X # #	×□_ ▲ <u>២</u> ⊻ <u></u>
	Press <i>Enter.</i>	AqeG	roup						
	Туре С19.		Name	Label	Transformation	Format	Data Type	Value Label	
	Press <i>Enter.</i>	1	AgeGroup					C15	
	Type C21.	3	Party					C17	
	Press <i>Enter</i> .	4	lssue					C21	
		5	C5						
	This attaches each value	6	C6						
	label column to the	8	C7 C8						
	approriate variable.	9	C9						
	Note that you may use	10	C10						
	the value lebel more	11	C11						
			ICIZ						
	than once.	Variabl	e Info She	et <u>1</u>					
		1 1							

Using the value labels in a report

We will now show you how the value labels change the output of the Frequency Table procedure.



74 Value Labels

- 2 Enter *AgeGroup-Issue* as the Discrete Variables.
- 3 Run the procedure by / pressing the *Run* button.

Frequency Tables _ 🗆 🗙 <u>File Run Analysis Graphics Window H</u>elp 🕨 🗅 🖻 📳 💷 🛃 🕵 🗙 💉 🎢 🛱 🖻 🗷 🖮 ? ? Template Legend Multinomial Combo Report Plot Options Reports Symbols Variables Breaks Format Missing Frequency Variable: iscrete Variables: ^ **±** Ŧ AgeGroup-Issue Numeric Variables (Limits): Interval Upper Limits: ▲ <u>+</u> 1,2 Numeric Variables (Width): Number of Intervals: 4 ₹ 5 • Minimum: Width: 🔲 Filter Active Fix the line count

The output appears as shown.

Notice that the value labels have <u>not</u> been used.

NCSS Output						_ 🗆 🗙
File Edit ⊻iew Format Windov	/ Help		a 💥 🖀 🗖			
			<u>* 15411++-1m</u>			
		Freque	ncy Table R	eport		<u> </u>
Page Database I Time/Date	1 D:\0A70\DATA\Politi 14:19:14 06-17-1997	c.S0 7				
Frequency Distribut	on of AgeGroup					
AgeGroup 1 2 3 4	Count 4 7 4 5	Cumulative Count 4 11 15 20	Percent 20.00 35.00 20.00 25.00	Cumulative Percent 20.00 55.00 75.00 100.00	Graph of Percent 	
Frequency Distribut	on of State	Cumulative		Cumulative	Graph of	
State 1 2 3 4	Count 6 3 5	Count 6 12 15 20	Percent 30.00 30.00 15.00 25.00	Percent 30.00 60.00 75.00 100.00	Percent 	
Frequency Distribut	on of Party	Cumulative		Cumulative	Graph of	
Party 1 2 3	Count 7 8 5	Count 7 15 20	Percent 35.00 40.00 25.00	Percent 35.00 75.00 100.00	Percent	
Frequency Distribut	on of Issue			.		
Issue 1 2 3 4 5	Count 5 5 3 4 3	Cumulative Count 5 10 13 17 20	Percent 25.00 25.00 15.00 20.00 15.00	Cumulative Percent 25.00 50.00 65.00 85.00 100.00	Graph of Percent 	
				Page 1/1	Line 1 C	• •

- 4 Select *Format* tab to display the Format panel
- 5 Select *Both* in the Value Labels box.
- 6 Run the analysis again by pressing the *Run* button.

to	🛱 Frequency Tables	_ 🗆 🗙
panel.	<u>File Run Analysis Graphics Window H</u> elp	
		2 ? ?
	Legend Multinomial <u>T</u> emplate	Value Labels are
Value	Reports Combo Report Plot Options Symbols	special labels
7	Variables Breaks Missing Format	individual values
gain by	Variable Names: Value Labels: Precision:	(1 = Yes, 2=No, etc.). This option
outton.	Names 🔹 Data Values 🗨 Single 💌	specifies whether
	Label Justification	the value labels.
	Tabs	
	Decimal Places	
	By Labels: Counts: Row %s: Column %s: Table %s: 0 ▼ 0 ▼ 1 ▼ 1 ▼ 1 ▼	
	¥	
	Fix the line count	

The output window appears as shown.



CHAPTER 14

Database Subsets

About this chapter

It is often useful to store all of your data in one large database and then analyze various subsets of the database as necessary. This can often be accomplished using the Filter mechanism. Sometimes you will find it more convenient to create a subset of the original database that only contains those rows that you want to analyze.

This chapter will take you through the steps necessary to create a subset of the POLITIC database (described in Chapter 13) which contains those individuals with AgeGroup equal to 2 (26 to 34).

If you have not already done so, please open the POLITIC database now by selecting Open from the File menu of the Data window.

Step 1 - Sort the database

The first step is to sort the POLITIC database by the variable (or variables) that you want to subset on. This is done as follows.

1 Select **Sort** from the Data menu.

Eile Edit	Data - [D:\0/	.70\D/ <u>G</u> raphi	∖TA\Politic cs <u>W</u> indow	. .s0] Help				2
	🖻 🚅 🧉 Data Report				2 2 %	📭 🔀 🐗	🛛 🏹 류	ldh
	<u>S</u> ort <u>F</u> ilter							
A	Enter Transform	1	Party	Issue	C5	C6	C7	
	Recalc <u>C</u> urrent	1	3	4				_
3	Recalc All	2	1	3				
4	2	1	1	4				
5	2	4	2	5				
			~	•	1			١
Variable <u>I</u> r	nfo Sheet <u>1</u>							
1 1								

2	Select AgeGroup as the	🗟 Sort		×
	variable to sort the database by. This may be done by using the drop-down menu or by double clicking.	Sort Database By AgeGroup	✓ Ascending	<u>O</u> k <u>C</u> ancel
3	Click Ok to sort the database by the selected	(none)	Ascending	Help
	variable.	Then By	☑ Ascending	

Step 2 - Copy subset into new database

The next step is copy the selected data from the POLITIC database to the new database (which will be named POLITIC2).

The database will be sorted by Agegroup.

- Select the desired subset by dragging the mouse from row 5 of column 1 (AgeGroup) to row 11 of column 4 (Issue). Your selection should appear as shown.
- 2 Press *Ctrl-C* to copy the selected data to the Windows clipboard (the clipboard is the name of temporary holding area used by Windows to store information that has been cut or copied).

	AgeGroup	State	Party	Issue	C5	C6	+
1	1	1	3	4			
2	1	4	3	2			
3	1	3	2	2			
4	1	2	1	5			
5	2	4	2	5			
6	2	4	1	1			
7)	2	3	1	1			
8	2	1	1	4			
9	2	2	2	1			
10	2	1	1	3			
11	2	2	1	4			
12	3	2	1	3			
13	3	3	2	1			
14	3	4	2	3			
15	3	1	2	5			
16	4	1	3	2			
17	4	2	3	2			
18	4	1	3	1			
19	4	4	2	4			
20	4	2	2	2			
21							+
+	1	1	1			+	É
Variabl	e Info Sheet	1					

3 Select *New* from the File menu to create the subset database.

🖗 NCSS	Data	- [D:\0A	70\DAT/	\\Politic	.s0]	
<u>Eile E</u> dit	<u>D</u> ata	Analysis	<u>G</u> raphics	<u>W</u> indow	<u>H</u> elp	
<u>N</u> ew				¥÷.	80	🗾 🧕 😪 🗣 🛪 🖋 🎢 🛱 և 😟
<u>O</u> pen			Ctrl+	⁰ ⊨		
<u>C</u> lose						



It is important not to save the sorted database because the value labels have also been sorted--something we do not want.

- 5 Click **Ok** to create a _____ spreadsheet type database.
- Create a New Data File

 Step 1 Select Type of Data File

 Step 2 Continue

 Spreadsheet (S0 file)

 Database (S0Z file)
- 6 Position the cursor in the upper left cell of the new database by clicking in it.

	C1	C2	C3	C4	C5	C6
1	I→ ⇔					
2						
3						
4						
5						

7 Press *Ctrl-V* to paste the clipboard data into the new database.

	C1	C2	C3	C4	C5	C6
1	e <u>2</u>	4	2	5		
2	2	4	1	1		
3	2	3	1	1		
4	2	1	1	4		
5	2	2	2	1		
6	2	1	1	3		
7	2	2	1	4		
8						
9						

80 Database Subsets

Select Save As from the 🖥 NCSS Data - [Untitled] 8 - 🗆 🗙 <u>File E</u>dit <u>D</u>ata <u>A</u>nalysis <u>G</u>raphics <u>W</u>indow <u>H</u>elp File menu to name and <u>N</u>ew... ¥± 💼 0 ۵ save this new database. Ctrl+O <u>O</u>pen... Close C8_^ A<u>d</u>d a Sheet C4 C5 C6 C7 Import. 1 Remove Last Sheet 1 5 Printer Setup. 1 Page Set<u>u</u>p... 3 Ctrl+P Print... 4 <u>S</u>ave Ctrl+S 4 Save <u>A</u>s Export. Exit NCSS

9	Enter <i>politic2.s0</i> as the	Save File As			? ×
	name of the new database.	Save in: 🔄 Da	ata	•	
	Click Save.	New Folder Ancova.s0 Asstime.s0 Assess.s0 Assess_Ttest1.S0 Baball.s0 Bridp263.s0 Box380.s0	Box402.s0 Cctest.s0 Contents0 Contents0 Contest.s0 Contest.s	 Crossovr.s0 Davis467.s0 DrugStudy.S0 Ds476.s0 Filter~1.s0 Fisher.s0 Frieg1.s0 Frreg2.s0 	a) Fnreg3.s0 a) Fnreg4.s0 a) Friedman.s0 a) Fruit.s0 a) Fuzzy.s0 a) Galileo1.s0 a) Gibbons.s0 a) Gnp.s0
		File <u>n</u> ame: Politi Save as <u>type</u> : Spre	c2.s0 adsheet*.S0		<u>S</u> ave Cancel

Step 3 - Copy variable info to new database

The next step is to copy the variable information datasheet to the new database.

Open the POLITIC 1 NCSS Data - [D:\0A70\DATA\Politic2.S0] _ 🗆 🗙 <u>File E</u>dit <u>D</u>ata <u>A</u>nalysis <u>G</u>raphics database by selecting it Wir He <u>N</u>ew... ¥± 🔂 🖸 2 2 5. 1. 2 2 27 7 1. 10 from the File menu. <u>O</u>pen.. Ctrl+O Close A<u>d</u>d a Sheet C4 C5 C6 C7 C8 _ ____ Import... Remove Last Sheet Printer Setup... Page Set<u>u</u>p.. 3 Ctrl+P Print. 4 Save Ctrl+S 4 Export.. Exit NCSS D:\0A70\DATA\POLITIC2.S0 D:\0A70\DATA\POLITIC.S0 D:\0A70\DATA\MAMMALS.S0 D:\0A70\DATA\MAMMALS1.S0 G:\NCSS60\DATA\MAMMALS.S0 D:\0A70\DATA\SAMPLE.S0 D:\0A70\DATA\FISHER.S0Z D:\0A70\DATA\FISHER.S0 • • 🗆 Variable Info Sheet1 1

2 Click on the **Variable Info** tab to move to the Variable Info datasheet.

		AgeGroup	State	Party	lssue	C5	C6	t
	1	1	1	3	4			
	2	4	2	2	2			
	3	3	2	1	3			
	4	2	1	1	4			
	5	2	4	2	5			
N	+	4	4	2	4		+	•
Į	Wariable	e Info Sheet	L					_

- 3 Select the information to be copied by dragging the mouse across it.
- 4 Press *Ctrl-C* to copy the information to the clipboard.
- 5 Open *POLITIC2.S0* by selecting it from the File menu.

	Name	Label	Transformation	Format	Data Type	Value Label 🕇		
1	AqeGroup					C15		
2	State					C17		
3	Party					C19		
4	lssue					C21		
5	C5							
6	<u></u>					•		
Variable Info Sheet1								

NCSS Data - [D:\0A70\]	DATA\PC	ЫT	IC.S0]				_ 🗆 >
<u>File E</u> dit <u>D</u> ata <u>A</u> nalysis <u>G</u> ra	phics <u>W</u> ine	wob	<u>H</u> elp				
<u>N</u> ew		¥÷.		2 2 3	. 📭 🔀	🐠 💥 🚝	1 In I
<u>O</u> pen	Ctrl+O					<u>* 1. 1. 1.</u>	
<u>C</u> lose							
A <u>d</u> d a Sheet			Issue	C5	C6	C7	C_
<u>I</u> mport		3	4				
Remove <u>L</u> ast Sheet		2	2				
Printer Setun		1	3				
Page Setup		1	4				
Print	Ctrl+P	2	5				
	0.1.0	2	4				
Save	Ctrl+S	1	1				
Save <u>A</u> s		3	2				
Export		2	1				
<u>E</u> xit NCSS		1	3				
D:\0A70\DATA\POLITIC.S0		3	2				
D:\0A70\DATA\POLITIC2.S0		2	2				
D:\0A70\DATA\MAMMALS.S0		2	1				

6 Move to the Variable Info datasheet by clicking the *Variable Info* tab.

		C1	C2	C3	C4	C5	C6	C7	1
	1	2	4	2	5				
I	2	2	4	1	1				
I	3	2	3	1	1				
	4	2	1	1	4				
	5	2	2	2	1				
	6	2	1	1	3				
ľ	7	2	2	1	4				Ŧ
	À.							+	
l	Variable Info Sheet1								

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- 7 Position the cell cursor over the cell containing *C1*.
- 8 Press *Ctrl-V* to paste the label information into the subset database.

	Name	Label	Transformation	Format	Data Type	Value Label 🕇			
1	. C1]							
2	C2								
3	C3								
4	C4								
5	C5								
6	C6								
7	C7					+			
+						→			
Variab	Variable Info Sheet1 /								

The result will appear as shown.

	Name	Label	Transformation	Format	Data Type	Value Label	t		
1	AgeGroup					C15			
2	State					C17			
3	Party					C19			
4	Issue					C21			
5	C5						+		
← →									
Variat	/ariable info Sheet1 /								

Step 4 - Copy value labels to the new database

The final step is to copy the value labels from the old database to the subset database.

1 Open the POLITIC.SO	RCSS Data - [D:\0A7	O\DATA\P	olitic2.SO]				_ 🗆 ×
database by selecting it from the File menu.	New Open Close	Ctrl+O			90FF 1 + X	💉 👬 🖷	
	Add a Sheet Import Remove Last Sheet Printer Setup Page Setup Print Save Save As Export Exit NCSS D:\0A70\DATA\POLITIC2.S0 D:\0A70\DATA\POLITIC2.S1 D:\0A70\DATA\MAMMALS1: G:\NCS560\DATA\PAMMALS1: D:\0A70\DATA\FISHER.S02 D:\0A70\DATA\FISHER.S0 Variable Info Sheet[1 1	Ctrl+P Ctrl+S Ctrl+S 50 S.S0	C4 1 2 2 1 1 1	C5 1 1 5 1 3 4 4 4 4 4 4 4 4		C7	



3 Enter *politic2.s0* in the File Name field of the Save File As dialog box.

Click the **Save** button. When asked, indicate that you want to replace the previous version of this file.

vame	Save File As			? ×
og 🦳	Save in:	Data	• E	
ou	A Fnreg3.st Fnreg4.s0 Friedman.s0 Friut.s0 Forexy.s0 Galileo1.st Galileo1.st Galibons.s0 Gap.s0	Heart.s0 Intel.s0 Johnson.s0 Johnson.s0 A Latinsqr.s0 Latinsqr.s0 Login1.s6 Login1.s6	Mammals.s0 Mammals1.s0 Mammals2.s0 Manova1.s0 Mantel.s0 Mdantel.s0 Mds2.s0 Mds3.s0 Mdc2.s0	Odor.s0 Pass1way.s0 Pca2.s0 Pie.s0 Plants0 Plants0 Politic.s0 Politic.s0 Politic2.S0 Poli
	File <u>n</u> ame: Po Save as type: Sp	litic2.S0 readsheet*.S0		Save Cancel

4 Reposition the datasheet so that the first column is *C15*. Drag the mouse across and down so that all of the value labels are selected as shown below.

	C15	C16	C17	C18	C19	C20	C21	C22	C23 +
1	1	25 and under	1	California	1	Democrat	1	Strongly agree	
2	2	26 to 34	2	Virginia	2	Republicar	2	Agree	
3	3	35 to 55	3	Texas	3	Other	3	Neutral	
4	4	56 and above	4	Other			4	Disagree	
5							5	Strongly disagree	
6									
7									
.8									+
+									
Variable	e <u>I</u> nfo	Sheet <u>1</u>							

5 Press *Ctrl-C* to copy the selected information to the clipboard.

6	Open the POLITIC2.S0	NCSS Data - [D:\0A70	DATA\PC	LITIC.S0]				- 🗆 ×
	database by selecting it	<u>File</u> Edit <u>D</u> ata <u>A</u> nalysis <u>G</u> r	aphics <u>W</u> ind	dow <u>H</u> elp				
	from the File menu.	Open	Ctrl+O			VOFF V* X	211 न	
		Add a Sheet		Issue	C5	C6	C7	C_
		<u>I</u> mport Remove <u>L</u> ast Sheet		3 2	2			
		Printer Setup Page Set <u>u</u> p		1	3 4			
		Print	Ctrl+P	2	5 4			
		<u>S</u> ave Save <u>A</u> s	Ctrl+S	1	1			
		Export		2	1			
				3	2			
		D:\0A70\DATA\POLITIC2.S0 D:\0A70\DATA\MAMMALS.S0		2	2			

- 7 Reposition the datasheet so that variable **C15** is at the left.
- 8 Click in the first row of variable *C15* so that this is the active cell.
- 9 Press Ctrl-V to copy the information. The final result should appear as below.

	C15	C16	C17	C18	C19	C20	C21	C22	C23	C	t
1	1	25 and und	1	California	1	Democrat	1	Strongly ac	jree		
2	2	26 to 34	2	Virginia	2	Republicar	2	Agree			
3	3	35 to 55	3	Texas	3	Other	3	Neutral			
4	4	56 and abo	4	Other			4	Disagree			
5							5	Strongly di	sagree		
6											
_7											ŧ
← _											
Variabl	Variable Info Sheet1 /										

10 Select Save from the File menu to save the database before you forget.

That's it. Let's briefly review the steps:

- 1 Sort the database by the variables on which you want to subset.
- 2 Copy the subset data to a new database.
- 3 Copy the variable info from the old database to the subset database.
- 4 Copy value label information from the old database to the subset database (if it exists).

CHAPTER 15

Simulation

About this chapter

There are many situations in which you want to generate data that follow a known distribution. For example, you may want to generate 100 uniform random numbers as an aid in selecting a random sample or you may want to generate five columns of normal random numbers to experiment with a particular statistical test. This chapter will show you how to use transformations to generate simulated data.

NCSS directly generates two types of random numbers: uniform and normal. Other types of random numbers may be generated by using their inverse probability function on a set of uniform random numbers.

Generating uniform random numbers

In this tutorial you will generate 100 uniform random numbers.

You should begin this tutorial with an empty database. If your database is not empty, follow the instructions on page 14 to clear it.

1	Move to the Variable Info datasheet by clicking the	8 NCS	S Data	a - [Unti	tled]		_ 🗆 ×
	Variable Info tab.		וד <u>D</u> ata	<u>A</u> naiysi	s <u>G</u> raphics	<u>w</u> indow <u>H</u> eip	J
			F	¥ 🖻	🛍 🖊 🗠	F 📫 🗖	· 📃 🖉
	\backslash		C1	C2	C3	C4	C5 🔺
		1					
	\backslash	2		Ī			
		3					
		4					
	\backslash	5					
	\mathbf{n}	6					
		•					
		🗸 Variabl	e <u>I</u> nfo	Sheet <u>1</u>			
		1 1					

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2 Enter *100* in the Number of Rows box.

This specifies the number of rows to be generated.

3 Enter **Uniform(3)** as the transformation for variable C1.

Note that the "3" in the parenthesis is ignored. The program generates a random "seed" so that a different set of random numbers will be used each time you recalculate the spreadsheet.

	🖉 NC:	SS Data -	[Untitle	d]	-	□×		
	<u>File E</u>	<u>dit Data A</u>	<u>nalysis</u>	<u>G</u> raphics <u>W</u> indow	<u>H</u> elp			
		📂 🔛 🐰	b		H 00			
ľ	Unifo	orm(3)						
l		Name	Label	Transformation	Format	D_		
t	1	C1		Uniform(3)				
l	2	C2			-			
l	3	C3						
l	4	C4						
l	5	C5						
l	6	C6						
	7	07						
	Variable Info Sheet1							
	3 1							

- 4 Press the *Apply Transformation* button to generate the random numbers.
- 5 Click the **Sheet1** tab to view the data.

The data will appear as shown. However, the numbers themselves will be different since each recalculation uses a different starting seed.

6 Press the Apply Transformation button a few more times to generate new sets of random numbers.

	🖗 NCS	SS Data - [Untitled]			_ 🗆 🗙
	<u>File</u>	dit <u>D</u> ata <u>A</u> n	ialysis <u>G</u> rap	ihics <u>W</u> indo	w <u>H</u> elp	
	🗅 🖻	🎽 🔛 🎽	Þ 🔒 🖊	60 F **	100	📃 🛃 💈
	0.528	9270281791	69			
		C1	C2	C3	C4	C5 🔺
	1	0.528927				
	2	0.4539105				
	3	0.6461843				
	4	0.6051905				
	5	0.8081889				
I	6	0.8966426				
		По 706/350				▼
	Variab	le <u>I</u> nfo She	et <u>1</u>			
	1 1					

Simulating the t-test with n = 5

We will now run a simulation in which we generate 100 one sample t-test values with a sample size of five. Four of the values will come from a normal distribution with mean 50 and standard deviation 2. The fifth value will come from a normal distribution with mean 50 and standard deviation 15. The t-test will test the null hypothesis that the population mean of the sample is 50.

It will be interesting to study the distribution of these t-values since the t-test makes the assumption that all five data values follow identical distributions. This simulation will allow us to study the distortion that occurs when this assumption is not met.

1	Enter 100 for the number of	🐻 NC	SS Data	- [Untitle	ed]		
		<u>F</u> ile <u>I</u>	<u>E</u> dit <u>D</u> ata	<u>Analysis</u>	<u> </u>	əlp	
			🍝 🔛 🍝	Þ 🛍 🖊		🧕 🐨 📴 🔀	1
		0.000	0				
2	Enter the new variable names		Name	Label	Transformation	Format	D 🔺
-		1	X1		50+RandomNormal(3)*2	0.0000	
		2	X2		50+RandomNormal(3)*2	0.0000	
~		3	X3		50+RandomNormal(3)*2	0.0000	
3	Enter the transformations.	4	X4		50+RandomNormal(3)*2	0.0000	
	Notice that we multiply the	5	X5		50+RandomNormal(3)*15	0.0000	
	random normal by the	6	Mean		Average(X1:X5)	0.0000	
	standard deviation (2 or 15)	7	Sigma		Stddev(X1:X5)	0.0000	
	and then add the mean (50)	8	TValue		(Mean-50)/(Sigma/Sqrt(5))	0.0000	
		9	C9				
		10	C10				
		11	111				╮╧╢
4	Enter 0.0000 as the format for -						
	each of the variables. This will	Variab	le <u>I</u> nfo She	et <u>1</u>			
	make the data much easier to	4 1					
	read.	<u> </u>					
				\			

5 Move to the empty spreadsheet by clicking Sheet1.

6	Click the Apply	😫 NCS	S Data - [Untitled]							_ 🗆 ×
	Transformation button	<u>File E</u> c	lit <u>D</u> ata <u>A</u> n	alysis <u>G</u> rap	hics <u>W</u> indov	w <u>H</u> elp					
	to generate the		🍝 🖳 🛰	9 B A	► F ^{**}	100	؟ 💆 📃	õfe 📭 🗙 g	🥙 271 🚟	🛍 😟 🖄 E	<u>**</u>
	simulated data. Your		¥1	¥2	¥3	Y4	¥5	Mean	Sigma	TValue (• <u>•</u>
	results will be similar to		48 3921	51 9525	47 7793	51 8861	48 1176	49 6255	2 1053	-0.3977	<u> </u>
	ours.	2	47.5683	49.9502	50.2135	50.8996	50.5912	49.8446	1.3228	-0.2627	
	00101	3	50.7785	48.2142	47.3029	50.6756	47.8409	48.9624	1.6435	-1.4117	
	Note that if you have	4	51.8229	46.8261	50.9101	49.3581	49.7921	49.7419	1.8939	-0.3048	
	made an error in	5	46.1972	53.0629	47.5932	51.2865	50.0654	49.6410	2.7681	-0.2900	
		6	49.9673	50.2716	45.4807	49.8704	48.8516	48.8883	1.9783	-1.2565	
	entering the		50.6444	44.7447	51.1464	50.4649	49.7870	49.3575	2.6242	-0.5475	
	transformation	8	32.0601	48 6307	00.4842 10.5837	50.2452	40.8281	00.0420 48.0328	2.4100	-2 1034	
	formulas you will have	10	49 2848	49.2302	49 6039	45 4160	49.1203	48 6881	1.8491	-1.5865	
	to go hook to the	11	52.2335	47.2171	49.6505	47.1336	49.3312	49.1132	2.0968	-0.9457	
	to go back to the	12	51.9501	50.7356	49.6486	51.4414	53.3920	51.4335	1.3942	2.2990	
	Variable Info datasheet	13	50.9926	48.1249	49.2187	45.7411	46.7709	48.1696	2.0571	-1.9896	
	to make corrections.	14	49.4895	48.7948	48.5518	47.5049	51.7214	49.2125	1.5731	-1.1194	•
		Variabl	elnfo She	et <u>1</u>							
		9 1									

There are many ways to analyze the results. One of the easiest is to sort the Tvalue column and count the number of rows whose values are outside the theoretical bounds. If these data had come from a normal distribution with a mean of 50 and a standard deviation of 2, you can use the Probability Calculator to determine the theoretical cut off values. The two-tail critical value for a t distribution with four degrees of freedom and alpha = 0.05 is 2.78. Hence, you would expect that five of the one hundred values would be less than -2.78 or greater than 2.78.

Here's how to sort the data:

1	Select <i>Sort</i> from the Data menu. This will bring up the Sort window.	Sort Sort Database By TValue	
2	Select <i>Tvalue</i> as the sort variable.	Then By (Home)	
3	Click Ok to perform the sort.	Then By	

4 Scroll from through your data, counting how many values are less than -2.78 or greater than 2.78.

	X5	Mean	Sigma	Tvalue	C9
1	49.3032	48.4274	1.3275	-2.6489	
2	29.2799	43.8124	8.2079	-1.6857	
3	40.6481	47.0399	3.9910	-1.6585	
4	43.0464	48.1429	3.0174	-1.3762	
5	40.2060	47.3166	4.4716	-1.3419	
6	30.3861	45.2287	8.3311	-1.2806	
7	04 0179	A3 7301	11 2022	1 2225	

	X5	Mean	Sigma	Tvalue	C9
94	54.8138	51.9395	2.6372	1.6445	
95	57.6396	52.3783	3.1958	1.6640	
96	57.1890	52.2512	3.0049	1.6752	
97	56.9590	52.1490	2.8435	1.6899	
98	56.6380	52.0277	2.6669	1.7002	
99	61.8765	53.8225	4.6030	1.8569	
100	51.1518	51.8507	1.1012	3.7580	
101					

In our case only one row is outside the range. We repeated this simulation several times and never found more than three values outside the range, much less than the five values that the null hypothesis predicted.

Cross Tabs on Summarized Data

About this chapter

This chapter presents an example of how to enter and analyze a contingency table that has already been summarized.

Sample Data

The following data are the results of a study that tested the impact of three drugs on a certain disease.

		Drug	
<u>Disease</u>	<u>Type 1</u>	<u>Type 2</u>	<u> Type 3</u>
Yes	15	28	44
No	4	7	9

These data are entered into an NCSS database as follows.

Notice that we have created three variables:

- 1 One containing the column identification number (**Drug**).
- 2 One containing the row identification number (**Disease**).
- 3 One containing the counts (**Count**).

	Drug	Disease	Count	C4
1	1	1	15	
2	1	0	4	
3	2	1	28	
4	2	0	7	
5	3	1	44	
6	3	0	9	
7				

Filling out the Cross Tabulation window

The next step would be to fill out the Cross Tabulation window. This is done as follows.

1 Choose Cross Tabulation from the Descriptive Statistics submenu of the Analysis menu. This will load the Cross Tabulation

	window.	🛱 Cross Tabulation 📃 🗆 🗙
2	Enter <i>Drug</i> in the Discrete Variables box under Table Columns heading.	Eile Bun Analysis Graphics Window Help Image: Second Sec
3	Enter Disease in the Discrete Variables box under Table Rows heading.	Table Columns Table Rows Discrete Variables: Discrete Variables: DRUG DISEASE Numeric Variables (Width): Image: Column: Vidth: Number: Minimum: Vidth: S S S
4	Enter <i>Count</i> in the Frequency	Frequency Variable: COUNT
5	Press the <i>Run</i> button to run the analysis.	Example4 - Summarized Data

The final result will appear as follows.

B NCSS Output									
Eile Edit View Format	Window Help			딸 [m] [m] [½] [#	#				
				micopolit					
Page Database	1								
Time/Date	08:02:43 06	5-18-1997							
Frequency	Count								
Counts Section									
Disease	Drug 1	2 3		Total					
0	4	7 9	,	20					
	15	28 4	14	87					
The number of	of rows with at leas	t one missing value	e is O	107					
Chi-Square S	Statistics Section		044445						
Degrees of F	reedom		2.000000						
Probability Le	evel		0.899809	Acce	ept Ho				
WARNING: At less one cell had an expected value less than 5.									
×									
			Page 1/1	Line 1 Co					

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