

GETTING STARTED WITH STATA[®] FOR WINDOWS[®] RELEASE 11



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Cross-referencing the documentation

When reading this manual, you will find references to other Stata manuals. For example,

[U] **26 Overview of Stata estimation commands**

[R] **regress**

[D] **reshape**

The first example is a reference to chapter 26, *Overview of Stata estimation commands*, in the *User's Guide*; the second is a reference to the **regress** entry in the *Base Reference Manual*; and the third is a reference to the **reshape** entry in the *Data-Management Reference Manual*.

All the manuals in the Stata Documentation have a shorthand notation:

[GSM]	<i>Getting Started with Stata for Mac</i>
[GSU]	<i>Getting Started with Stata for Unix</i>
[GSW]	<i>Getting Started with Stata for Windows</i>
[U]	<i>Stata User's Guide</i>
[R]	<i>Stata Base Reference Manual</i>
[D]	<i>Stata Data-Management Reference Manual</i>
[G]	<i>Stata Graphics Reference Manual</i>
[XT]	<i>Stata Longitudinal-Data/Panel-Data Reference Manual</i>
[MI]	<i>Stata Multiple-Imputation Reference Manual</i>
[MV]	<i>Stata Multivariate Statistics Reference Manual</i>
[P]	<i>Stata Programming Reference Manual</i>
[SVY]	<i>Stata Survey Data Reference Manual</i>
[ST]	<i>Stata Survival Analysis and Epidemiological Tables Reference Manual</i>
[TS]	<i>Stata Time-Series Reference Manual</i>
[I]	<i>Stata Quick Reference and Index</i>
[M]	<i>Mata Reference Manual</i>

Detailed information about each of these manuals may be found online at

<http://www.stata-press.com/manuals/>

About this manual

This manual discusses **Stata for Windows**[®]. Stata for Mac[®] users should see *Getting Started with Stata for Mac*; Stata for Unix[®] users should see *Getting Started with Stata for Unix*. This manual is intended both for people completely new to Stata and for experienced Stata users new to Stata for Windows. Previous Stata users will also find it helpful as a tutorial on some new features in Stata for Windows.

Following the numbered chapters are four appendices with information specific to Stata for Windows.

We provide several types of technical support to registered Stata users. [GSW] **4 Getting help** describes the resources available to help you learn about Stata's commands and features. One of these resources is the Stata web site (<http://www.stata.com>), where you will find answers to frequently asked questions (FAQs), as well as other useful information. If you still have questions after looking at the Stata web site and the other resources described in [GSW] **19 Updating and extending Stata—Internet functionality**, you can contact us as described in [U] **3.9 Technical support**.

Using this manual

The new user will get the most out of this book by treating it as an exercise book, working through each example at the computer. The material builds, so material from earlier chapters will often be used in later chapters. Bear in mind that Stata is a rich and deep statistical package—just like statistics itself. The time spent working the examples will be repaid with dividends when doing true statistical analyses.

The experienced user may still have something to learn from this manual, despite its name. We suggest looking through the chapters to see if there is anything new or forgotten.

1 Introducing Stata—sample session

Introducing Stata

This chapter will run through a sample work session, introducing you to a few of the basic tasks that can be done in Stata, such as opening a dataset, investigating the contents of the dataset, using some descriptive statistics, making some graphs, and doing a simple regression analysis. As you would expect, we will only brush the surface of many of these topics. This approach should give you a sample of what Stata can do and how Stata works. There will be brief explanations along the way, with references to chapters later in this book, as well as to the online help and other Stata manuals. We will run through the session by using both menus and dialogs and Stata's commands, so that you can gain some familiarity with both.

Take a seat at your computer, put on some good music, and work along with the book.

Sample session

The dataset that we will use for this session is a set of data about vintage 1978 automobiles sold in the United States.

To follow along using point-and-click, note that the menu items are given by **Menu > Menu Item > Submenu Item > etc.** To follow along using the Command window, type the commands that follow a dot (.) in the boxed listings below into the small window labeled **Command**. When there is something of note about the structure of a command, it will be pointed out as a “Syntax note”.

Start by loading the `auto` dataset, which is included with Stata. To use the menus,

1. Select **File > Example Datasets...**
2. Click on **Example datasets installed with Stata.**
3. Click on **use for auto.dta.**

The result of this command is threefold:

- Some output appears in the large Results window.

```
. sysuse auto
(1978 Automobile Data)
```

The output consists of a command and its result. The command is bold and follows the period (.): **sysuse auto**. The output is in the standard face here and is a brief description of the dataset.

Note: If a command intrigues you, you can type `help commandname` in the Command window to find help. If you want to explore at any time, **Help > Search...** can be informative.

- The same command, `sysuse auto`, appears in the small Review window to the upper left. The Review window keeps track of commands Stata has run, successful and unsuccessful. The commands can then easily be rerun. See [\[GSW\] 2 The Stata user interface](#) for more information.
- A series of variables appears in the small Variables window to the lower left.

You could have opened the dataset by typing `sysuse auto` in the Command window and pressing *Enter*. Try this now. `sysuse` is a command that loads (uses) example (system) datasets. As you will see during this session, Stata commands are often simple enough that it is faster to use them directly. This will be especially true once you become familiar with the commands you use the most in your daily use of Stata.

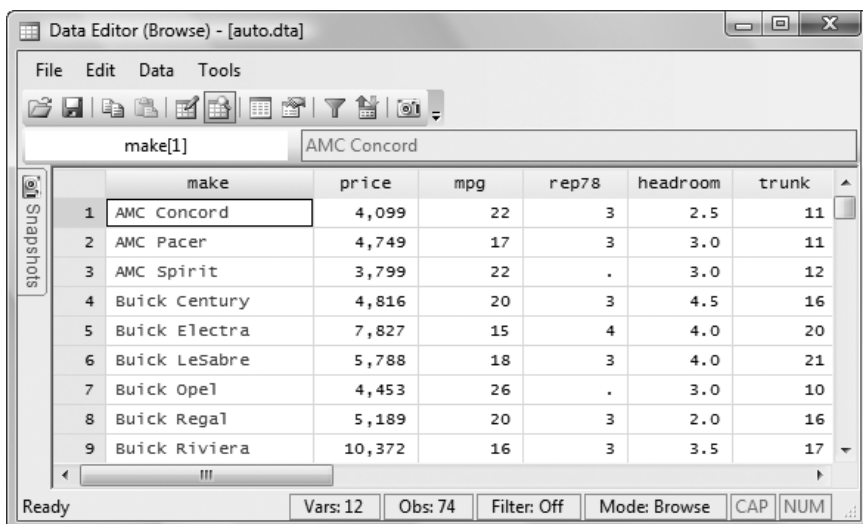
Syntax note: In the above example, `sysuse` is the Stata command, whereas `auto` is the name of a Stata data file.

Simple data management

We can get a quick glimpse at the data by browsing it in the **Data Editor**. This can be done by clicking on the **Data Editor (Browse)** button, , or by selecting **Data > Data Editor > Data Editor (Browse)** from the menus, or typing the command `browse`.

Syntax note: Here the command is `browse` and there are no other arguments.

When the Data Editor window opens, you can see that Stata regards the data as one rectangular table. This is true for all Stata datasets. The columns represent *variables*, whereas the rows represent *observations*. The variables have somewhat descriptive names, whereas the observations are numbered.



	make	price	mpg	rep78	headroom	trunk
1	AMC Concord	4,099	22	3	2.5	11
2	AMC Pacer	4,749	17	3	3.0	11
3	AMC Spirit	3,799	22	.	3.0	12
4	Buick Century	4,816	20	3	4.5	16
5	Buick Electra	7,827	15	4	4.0	20
6	Buick LeSabre	5,788	18	3	4.0	21
7	Buick Opel	4,453	26	.	3.0	10
8	Buick Regal	5,189	20	3	2.0	16
9	Buick Riviera	10,372	16	3	3.5	17

The data are displayed in multiple colors—at first glance it appears that the variables listed in black are numeric, whereas those that are in colors are text. This is worth investigating. Click on a cell under the `make` variable: the input box at the top displays the make of the car. Scroll to the right until you see the `foreign` variable. Click on one of its cells. Although the cell may display “Domestic”, the input box displays a 0. This shows that Stata can store categorical data as numbers but display human-readable text. This is done by what Stata calls *value labels*. Finally, under the `rep78` variable, which looks to be numeric, there are some cells containing just a period (.). As we will see, these correspond to missing values.

Looking at the data in this fashion, though comfortable, lends little information about the dataset. It would be useful for us to get more details about what the data are and how the data are stored. Close the Data Editor by clicking on its close button.

We can see the structure of the dataset by *describing* its contents. This can be done either by going to **Data > Describe data > Describe data in memory** in the menus and clicking on **OK** or by typing `describe` in the Command window and pressing `Enter`. Regardless of which method you choose, you will get the same result:

```
. describe
Contains data from C:\Program Files\Stata11\ado\base/a/auto.dta
  obs:          74              1978 Automobile Data
  vars:         12              13 Apr 2009 17:45
  size:        3,478 (99.9% of memory free)  (_dta has notes)
```

variable name	storage type	display format	value label	variable label
make	str18	%-18s		Make and Model
price	int	%8.0gc		Price
mpg	int	%8.0g		Mileage (mpg)
rep78	int	%8.0g		Repair Record 1978
headroom	float	%6.1f		Headroom (in.)
trunk	int	%8.0g		Trunk space (cu. ft.)
weight	int	%8.0gc		Weight (lbs.)
length	int	%8.0g		Length (in.)
turn	int	%8.0g		Turn Circle (ft.)
displacement	int	%8.0g		Displacement (cu. in.)
gear_ratio	float	%6.2f		Gear Ratio
foreign	byte	%8.0g	origin	Car type

Sorted by: **foreign**

If your listing stops short, and you see a blue `—more—` at the base of the Results window, pressing the Spacebar or clicking on the blue `—more—` itself will allow the command to be completed.

At the top of the listing, some information is given about the dataset, such as where it is stored on disk, how much memory it occupies, and when the data were last saved. The bold **1978 Automobile Data** is the short description that appeared when the dataset was opened and is referred to as a *data label* by Stata. The phrase `_dta has notes` informs us that there are notes attached to the dataset. We can see what notes there are by typing `notes` in the Command window:

```
. notes
_dta:
  1. from Consumer Reports with permission
```

Here we see a short note about the source of the data.

Looking back at the listing from `describe`, we can see that Stata keeps track of more than just the raw data. Each variable has the following:

- A *variable name*, which is what you call the variable when communicating with Stata.
- A *storage type*, which is the way in which Stata stores its data. For our purposes, it is enough to know that types beginning with `str` are *string*, or text, variables, whereas all others are numeric. See [U] [12 Data](#).
- A *display format*, which controls how Stata displays the data in tables. See [U] [12.5 Formats: Controlling how data are displayed](#).
- A *value label* (possibly). This is the mechanism that allows Stata to store numerical data while displaying text. See [GSW] [9 Labeling data](#) and [U] [12.6.3 Value labels](#).

- A *variable label*, which is what you call the variable when communicating with other people. Stata uses the variable label when making tables, as we will see.

A dataset is far more than simply the data it contains. It is also information that makes the data usable by someone other than the original creator.

Although describing the data says something about the structure of the data, it says little about the data themselves. The data can be summarized by clicking on **Statistics > Summaries, tables, and tests > Summary and descriptive statistics > Summary statistics** and clicking on the **OK** button. You could also type `summarize` in the Command window and press *Enter*. The result is a table containing summary statistics about all the variables in the dataset:

```
. summarize
```

Variable	Obs	Mean	Std. Dev.	Min	Max
make	0				
price	74	6165.257	2949.496	3291	15906
mpg	74	21.2973	5.785503	12	41
rep78	69	3.405797	.9899323	1	5
headroom	74	2.993243	.8459948	1.5	5
trunk	74	13.75676	4.277404	5	23
weight	74	3019.459	777.1936	1760	4840
length	74	187.9324	22.26634	142	233
turn	74	39.64865	4.399354	31	51
displacement	74	197.2973	91.83722	79	425
gear_ratio	74	3.014865	.4562871	2.19	3.89
foreign	74	.2972973	.4601885	0	1

From this simple summary, we can learn a bit about the data. First of all, the prices are nothing like today’s car prices—of course, these cars are now antiques. We can see that the gas mileages are not particularly good. Automobile aficionados can gain some feel for other characteristics.

There are two other important items here:

- The `make` variable is listed as having no observations. It really has no numerical observations, because it is a string (text) variable.
- The `rep78` variable has 5 fewer observations than the other numerical variables. This implies that `rep78` has five missing values.

Although we could use the `summarize` and `describe` commands to get a bird’s eye view of the dataset, Stata has a command that gives a good in-depth description of the structure, contents, and values of the variables: the `codebook` command. Either type `codebook` in the Command window and press *Enter* or navigate the menus to **Data > Describe data > Describe data contents (codebook)** and click on **OK**. We get a large amount of output that is worth investigating. In fact, we get more output than can fit on one screen, as can be seen by the blue `—more—` at the bottom of the Results window. Press the Spacebar a few times to get all the output to scroll past. (For more about `—more—`, see [More](#) in [\[GSW\] 10 Listing data and basic command syntax](#).) Look it over to see that much can be learned from this simple command. You can scroll back in the Results window to see earlier results, if need be. We will focus on the output for `make`, `rep78`, and `foreign`.

To start our investigation, we would like to run the `codebook` command on just one variable, say, `make`. We can do this via menus or the command line, as usual. To get the `codebook` output for `make` via the menus, start by navigating as before, to **Data > Describe data > Describe data**

contents (codebook). When the dialog appears, there are multiple ways to tell Stata to consider only the `make` variable:

- We could type `make` into the *Variables* field.
- The *Variables* field is a combobox control that accepts variable names. Clicking on the button to the right of the *Variables* field displays a list of the variables from the current dataset. Selecting a variable from the list will, in this case, enter the variable name into the edit field.

A much easier solution is to type `codebook make` in the Command window and then press *Enter*. The result is informative:

```
. codebook make
```

make	Make and Model
type:	string (str18), but longest is str17
unique values:	74 missing "": 0/74
examples:	"Cad. Deville" "Dodge Magnum" "Merc. XR-7" "Pont. Catalina"
warning:	variable has embedded blanks

The first line of the output tells us the variable name (`make`) and the variable label (`Make and Model`). The variable is stored as a string (which is another way of saying “text”) with a maximum length of 18 characters, though a size of only 17 characters would be enough. All the values are unique, so if need be, `make` could be used as an identifier for the observations—something that is often useful when putting together data from multiple sources or when trying to weed out errors from the dataset. There are no missing values, but there are blanks within the makes. This latter fact could be useful if we were expecting `make` to be a one-word string variable.

Syntax note: Telling the `codebook` command to run on the `make` variable is an example of using a *varlist* in Stata’s syntax.

Looking at the `foreign` variable can teach us about value labels. We would like to look at the codebook output for this variable, and on the basis of our latest experience, it would be easy to type `codebook foreign` into the Command window to get the following output:

```
. codebook foreign
```

foreign	Car type
type:	numeric (byte)
label:	origin
range:	[0,1] units: 1
unique values:	2 missing .: 0/74
tabulation:	Freq. Numeric Label
	52 0 Domestic
	22 1 Foreign

We can glean that `foreign` is an indicator variable, because its only values are 0 and 1. The variable has a value label that displays “Domestic” instead of 0 and “Foreign” instead of 1. There are two advantages of storing the data in this form:

- Storing the variable as a byte takes less memory, because each observation uses 1 byte instead of the 8 bytes needed to store “Domestic”. This is important in large datasets. See [U] 12.2.2 Numeric storage types.
- As an indicator variable, it is easy to incorporate into statistical models. See [U] 25 Working with categorical data and factor variables.

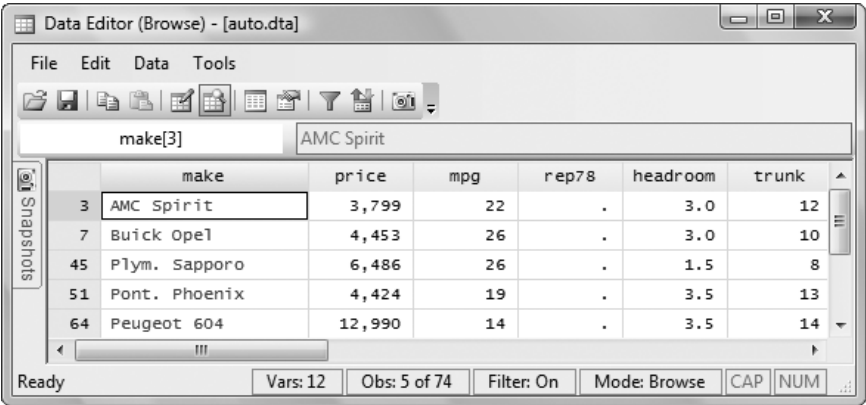
Finally, we can learn a little about a poorly labeled variable with missing values by looking at the rep78 variable. Typing codebook rep78 into the Command window yields

```
. codebook rep78
```

rep78		Repair Record 1978	
type: numeric (int)			
range: [1,5]		units: 1	
unique values: 5		missing .: 5/74	
tabulation:		Freq.	Value
		2	1
		8	2
		30	3
		18	4
		11	5
		5	.

rep78 appears to be a categorical variable, but because of lack of documentation, we do not know what the numbers mean. (To see how we would label the values, see [Changing data](#) in [GSW] 6 Using the Data Editor and see [GSW] 9 Labeling data.) This variable has five missing values, meaning that there are 5 observations for which the repair record is not recorded. We could use the Data Editor to investigate these 5 observations, but we will do this using the Command window only (doing so is much simpler). If you recall from earlier, the command brought up by clicking on the **Data Editor (Browse)** button was `browse`. We would like to browse only those observations for which rep78 is missing, so we could type

```
. browse if missing(rep78)
```



From this, we see that the `.` entries are indeed missing values—though other missing values are allowable. See [U] 12.2.1 [Missing values](#). Close the Data Editor after you are satisfied with this statement.

Syntax note: Using the `if` qualifier above is what allowed us to look at a subset of the observations.

Looking through the data lends no clues about why these particular data are missing. We decide to check the source of the data to see if the missing values were originally missing or if they were omitted in error. Listing the makes of the cars whose repair records are missing will be all we need, because we saw earlier that the values of `make` are unique. This can be done via the menus and a dialog:

1. Select **Data > Describe data > List data**.
2. Click on the button to the right of the *Variables* field to show the variable names.
3. Click on `make` to enter it into the *Variables* field.
4. Click on the **by/if/in** tab in the dialog.
5. Type `missing(rep78)` into the *If: (expression)* box.
6. Click on **Submit**. Stata executes the proper command but the dialog box remains open. **Submit** is useful when experimenting, exploring, or building complex commands. We will use primarily **Submit** in the examples. You may click on **OK** in its place if you like.

The same ends could be achieved by typing `list make if missing(rep78)`. The latter is easier, once you know that the command `list` is used for listing observations. In any case, here is the output:

```
. list make if missing(rep78)
```

	make
3.	AMC Spirit
7.	Buick Opel
45.	Plym. Sapporo
51.	Pont. Phoenix
64.	Peugeot 604

We go to the original reference and find that the data were truly missing and cannot be resurrected. See [GSW] 10 [Listing data and basic command syntax](#) for more information about all that can be done with the `list` command.

Syntax note: This command uses two new concepts for Stata commands—the `if` qualifier and the `missing()` function. The `if` qualifier restricts the observations on which the command runs to only those observations for which the expression is true. See [U] 11.1.3 [if exp](#). The `missing()` function tests each observation to see if it is missing. See [U] 13.3 [Functions](#).

Now that we have a good idea about the underlying dataset, we can investigate the data themselves.

Descriptive statistics

We saw above that the `summarize` command gave brief summary statistics about all the variables. Suppose now that we became interested in the prices while summarizing the data, because they seemed fantastically low (it was 1978, after all). To get an in-depth look at the `price` variable, we can use the menus and a dialog:

1. Select **Statistics > Summaries, tables, and tests > Summary and descriptive statistics > Summary statistics.**
2. Enter or select *price* in the *Variables* field.
3. Select *Display additional statistics.*
4. Click on **Submit.**

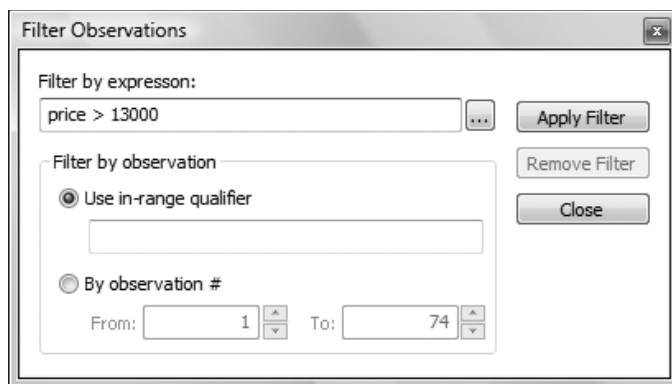
Syntax note: As can be seen from the Results window, typing `summarize price, detail` will get the same result. The portion after the comma contains *options* for Stata commands; hence, *detail* is an example of an option.

```
. summarize price, detail
```

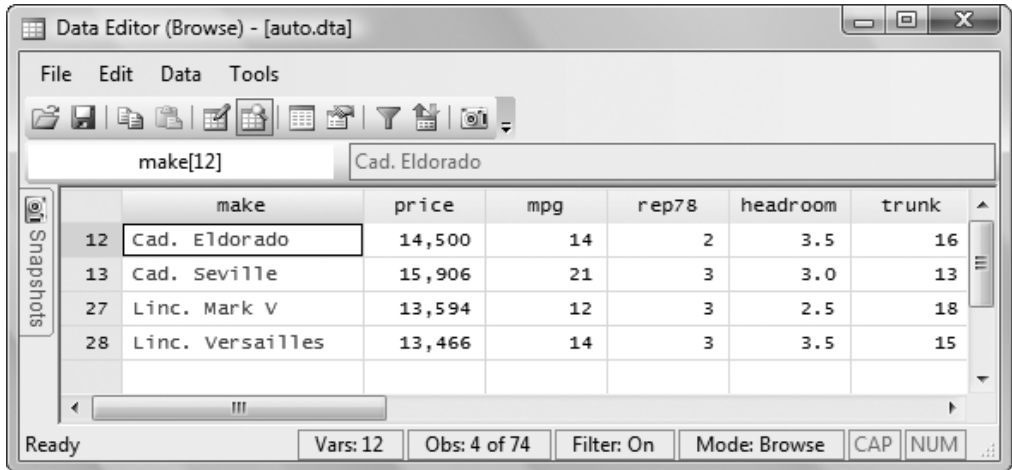
Price					
Percentiles		Smallest			
1%	3291	3291			
5%	3748	3299			
10%	3895	3667	Obs	74	
25%	4195	3748	Sum of Wgt.	74	
50%	5006.5		Mean	6165.257	
		Largest	Std. Dev.	2949.496	
75%	6342	13466			
90%	11385	13594	Variance	8699526	
95%	13466	14500	Skewness	1.653434	
99%	15906	15906	Kurtosis	4.819188	

From the output, we can see that the median price of the cars in the dataset is only about \$5,006! We can also see that the four most expensive cars are all priced between \$13,400 and \$16,000. If we wished to browse the cars that are the most expensive (and gain some experience with features of the Data Editor), we could start by clicking on the **Data Editor (Browse)** button, .

Once the Data Editor is open, we can click the **Filter Observations** button, , to bring up the *Filter Observations* dialog. We can look at the expensive cars by putting `price > 13000` in the *Filter by expression* field:



Pressing the **Apply Filter** button filters the data, and we can see that the expensive cars are two Cadillacs and two Lincolns, which have low gas mileage:



	make	price	mpg	rep78	headroom	trunk
12	Cad. Eldorado	14,500	14	2	3.5	16
13	Cad. Seville	15,906	21	3	3.0	13
27	Linc. Mark V	13,594	12	3	2.5	18
28	Linc. Versailles	13,466	14	3	3.5	15

We now decide to turn our attention to foreign cars and repairs, because as we glanced through the data, it appeared that the foreign cars had better repair records. (We do not know exactly what the categories 1, 2, 3, 4, and 5 mean, but we know the Chevy Monza was known for breaking down.) Let's start by looking at the proportion of foreign cars in the dataset along with the proportion of cars with each type of repair record. We can do this with one-way tables. The table for foreign cars can be done via menus and a dialog starting with **Statistics > Summaries, tables, and tests > Tables > One-way tables** and then choosing the variable `foreign` in the *Categorical variable* field. Clicking on **Submit** yields

```
. tabulate foreign
```

Car type	Freq.	Percent	Cum.
Domestic	52	70.27	70.27
Foreign	22	29.73	100.00
Total	74	100.00	

We see that roughly 70% of the cars in the dataset are domestic, whereas 30% are foreign made. The value labels are used to make the table so that the output is nicely readable.

Syntax note: We also see that this one-way table could be made using the `tabulate` command together with one variable, `foreign`.

(Continued on next page)

Making a one-way table for the repair records is simple—it will be simpler if done via the Command window. Typing `tabulate rep78` yields

```
. tabulate rep78
```

Repair Record 1978	Freq.	Percent	Cum.
1	2	2.90	2.90
2	8	11.59	14.49
3	30	43.48	57.97
4	18	26.09	84.06
5	11	15.94	100.00
Total	69	100.00	

We can see that most cars have repair records of 3 and above, though the lack of value labels makes us unsure what a “3” means. Take our word for it that 1 means a poor repair record and 5 means a good repair record. The five missing values are indirectly evident, because the total number of observations listed is 69 rather than 74.

These two one-way tables do not help us compare the repair records of foreign and domestic cars. A two-way table would help greatly, which we can get by using the menus and a dialog:

1. Select **Statistics > Summaries, tables, and tests > Tables > Two-way tables with measures of association**.
2. Choose `rep78` as the *Row variable*.
3. Choose `foreign` as the *Column variable*.
4. It would be nice to have the percentages within the `foreign` variable, so check the *Within-row relative frequencies* checkbox.
5. Click on **Submit**.

Here is the resulting output:

```
. tabulate rep78 foreign, row
```

Key			
<i>frequency</i>			
<i>row percentage</i>			
Repair Record 1978	Car type		Total
	Domestic	Foreign	
1	2 100.00	0 0.00	2 100.00
2	8 100.00	0 0.00	8 100.00
3	27 90.00	3 10.00	30 100.00
4	9 50.00	9 50.00	18 100.00
5	2 18.18	9 81.82	11 100.00
Total	48 69.57	21 30.43	69 100.00

The output indicates that foreign cars are generally much better than domestic cars when it comes to repairs. If you like, you could repeat the previous dialog and try some of the hypothesis tests available from the dialog. We will abstain.

Syntax note: We see that typing the command `tabulate rep78 foreign, row` would have given us the same table. Thus using `tabulate` with two variables yielded a two-way table. It makes sense that `row` is an option, because we went out of our way to check it in the dialog, so we changed the behavior of the command from its default.

Continuing our exploratory tour of the data, we would like to compare gas mileages between foreign and domestic cars, starting by looking at the summary statistics for each group by itself. We know that a direct way to do this would be to summarize `mpg` for each of the two values of `foreign`, by using `if` qualifiers:

```
. summarize mpg if foreign==0
```

Variable	Obs	Mean	Std. Dev.	Min	Max
mpg	52	19.82692	4.743297	12	34

```
. summarize mpg if foreign==1
```

Variable	Obs	Mean	Std. Dev.	Min	Max
mpg	22	24.77273	6.611187	14	41

It appears that foreign cars get somewhat better gas mileage—we will test this soon.

Syntax note: We needed to use a double equal sign (==) for testing equality. This could be familiar to you if you have programmed before. If it is unfamiliar, it is a common source of errors when initially using Stata. Thinking of equality as “really equal” can cut down on typing errors.

There are two other methods that we could have used to produce these summary statistics. These methods are worth knowing, because they are less error-prone. The first method duplicates the concept of what we just did by exploiting Stata’s ability to run a command on each of a series of nonoverlapping subsets of the dataset. To use the menus and a dialog, do the following:

1. Select **Statistics > Summaries, tables, and tests > Summary and descriptive statistics > Summary statistics** and click on the **Reset** button, .
2. Select mpg in the *Variables* field.
3. Select the *Standard display* option (if it is not already selected).
4. Click on the **by/if/in** tab.
5. Check the *Repeat command by groups* checkbox.
6. Select or type *foreign* for the grouping variable.
7. **Submit** the command.

You can see that the results match those from above. They have a better appearance because the value labels are used rather than the numerical values. The method is more appealing because the results were produced without knowing the possible values of the grouping variable ahead of time.

```
. by foreign, sort: summarize mpg
```

```
-> foreign = Domestic
```

Variable	Obs	Mean	Std. Dev.	Min	Max
mpg	52	19.82692	4.743297	12	34

```
-> foreign = Foreign
```

Variable	Obs	Mean	Std. Dev.	Min	Max
mpg	22	24.77273	6.611187	14	41

There is something different about the equivalent command that appears above: it contains a *prefix command* called a *by* prefix. The *by* prefix has its own option, namely, *sort*, to ensure that like members are adjacent to each other before being summarized. The *by* prefix command is important for understanding data manipulation and working with subpopulations within Stata. Store this example away, and consult [U] 11.1.2 [by varlist:](#) and [U] 27.2 [The by construct](#) for more information. Stata has other prefix commands for specialized treatment of commands, as explained in [U] 11.1.10 [Prefix commands](#).

The third method for tabulating the differences in gas mileage across the cars’ origins involves thinking about the structure of desired output. We need a one-way table of automobile types (foreign versus domestic) within which we see information about gas mileages. Looking through the menus yields the menu item **Statistics > Summaries, tables, and tests > Tables > One/two-way table of summary statistics**. Selecting this, entering *foreign* for *Variable 1* and *mpg* for the *Summarize variable*, and submitting the command yields a nice table:

```
. tabulate foreign, summarize(mpg)
```

Car type	Summary of Mileage (mpg)		Freq.
	Mean	Std. Dev.	
Domestic	19.826923	4.7432972	52
Foreign	24.772727	6.6111869	22
Total	21.297297	5.7855032	74

The equivalent command is evidently `tabulate foreign, summarize(mpg)`.

Syntax note: This is a one-way table, so `tabulate` uses one variable. The variable being summarized is passed to the `tabulate` command via an option.

A simple hypothesis test

We would like to run a hypothesis test for the difference in the mean gas mileages. Under the menus, **Statistics > Summaries, tables, and tests > Classical tests of hypotheses > Two-group mean-comparison test** leads to the proper dialog. Enter `mpg` for the *Variable name* and `foreign` for the *Group variable name*, and **Submit** the dialog. The results are

```
. ttest mpg, by(foreign)
```

Two-sample t test with equal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
Domestic	52	19.82692	.657777	4.743297	18.50638	21.14747
Foreign	22	24.77273	1.40951	6.611187	21.84149	27.70396
combined	74	21.2973	.6725511	5.785503	19.9569	22.63769
diff		-4.945804	1.362162		-7.661225	-2.230384
diff = mean(Domestic) - mean(Foreign)				t =	-3.6308	
Ho: diff = 0				degrees of freedom =	72	
Ha: diff < 0				Ha: diff != 0	Ha: diff > 0	
Pr(T < t) = 0.0003				Pr(T > t) = 0.0005	Pr(T > t) = 0.9997	

From this, we could conclude that the mean gas mileage for foreign cars is different from that of domestic cars (though we really ought to have wanted to test this before snooping through the data). We can also conclude that the command, `ttest mpg, by(foreign)` is easy enough to remember. Feel free to experiment with unequal variances, various approximations to the number of degrees of freedom, and the like.

Syntax note: The `by()` option used here is not the same as the `by` prefix command used earlier. Although it has a similar conceptual meaning, its usage is different because it is a particular option for the `ttest` command.

(Continued on next page)

Descriptive statistics, correlation matrices

We now change our focus from exploring categorical relationships to exploring numerical relationships: we would like to know if there is a correlation between miles per gallon and weight. We select **Statistics > Summaries, tables, and tests > Summary and descriptive statistics > Correlations and covariances** in the menus. Entering `mpg` and `weight`, either by clicking or by typing, and then submitting the command yields

```
. correlate mpg weight
(obs=74)
```

	mpg	weight
mpg	1.0000	
weight	-0.8072	1.0000

The equivalent command for this is natural: `correlate mpg weight`. There is a negative correlation, which is not surprising, because heavier cars should be harder to push about.

We could see how the correlation compares for foreign and domestic cars by using our knowledge of how the `by` prefix works. We can reuse the `correlate` dialog or use the menus as before if the dialog is closed. Click on the **by/if/in** tab, check the *Repeat command by groups* checkbox, and enter the `foreign` variable to define the groups. As done above on page 12, a simple `by foreign, sort:` prefix in front of our previous command would work, too:

```
. by foreign, sort: correlate mpg weight
```

```
-> foreign = Domestic
(obs=52)
```

	mpg	weight
mpg	1.0000	
weight	-0.8759	1.0000

```
-> foreign = Foreign
(obs=22)
```

	mpg	weight
mpg	1.0000	
weight	-0.6829	1.0000

We see from this that the correlation is not as strong among the foreign cars.

Syntax note: Although we used the `correlate` command to look at the correlation of two variables, Stata can make correlation matrices for an arbitrary number of variables:

```
. correlate mpg weight length turn displacement
(obs=74)
```

	mpg	weight	length	turn	displa~t
mpg	1.0000				
weight	-0.8072	1.0000			
length	-0.7958	0.9460	1.0000		
turn	-0.7192	0.8574	0.8643	1.0000	
displacement	-0.7056	0.8949	0.8351	0.7768	1.0000

This can be useful, for example, when investigating collinearity among predictor variables. In fact, simply typing `correlate` will yield the complete correlation matrix.

Graphing data

We have found several things in our investigations so far: We know that the average MPG of domestic and foreign cars differs. We have learned that domestic and foreign cars differ in other ways as well, such as in frequency-of-repair record. We found a negative correlation of MPG and weight—as we would expect—but the correlation appears stronger for domestic cars.

We would now like to examine, with an eye toward modeling, the relationship between MPG and weight, starting with a graph. We can start with a scatterplot of `mpg` against `weight`. The command for this is simple: `scatter mpg weight`. Using the menus requires a few steps because the graphs in Stata can be customized heavily.

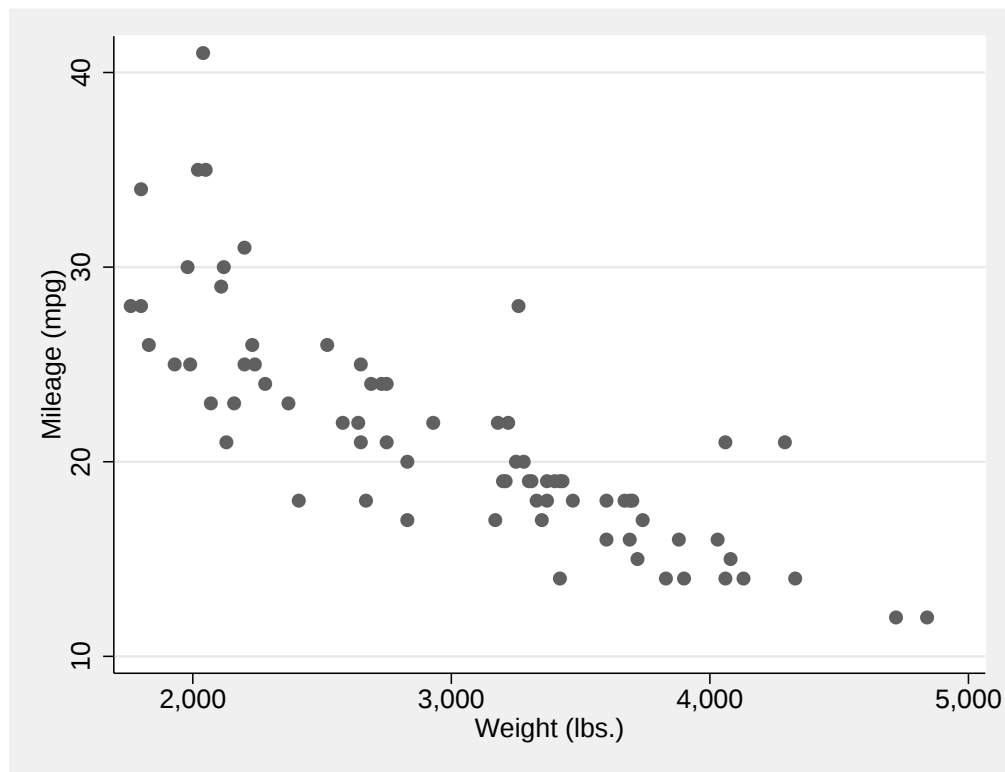
1. Select **Graphics > Twoway graph (scatter, line, etc.)**.
2. Click on the **Create...** button.
3. Select the *Basic plots* radio button (if it is not already selected).
4. Select *Scatter* as the basic plot type (if it is not already selected).
5. Select `mpg` as the *Y variable* and `weight` as the *X variable*.
6. Click on the **Submit** button.

The Results window shows the command that was issued from the menu:

```
. twoway (scatter mpg weight)
```

The command issued when the dialog was submitted is a bit more complex than the command suggested above. There is good reason for this: the more complex structure allows combining and overlaying graphs, as we will soon see. In any case, the graph that appears is

(Continued on next page)



We see the negative correlation in the graph, though the relationship appears to be nonlinear.

Note: When you draw a graph, the Graph window appears, probably covering up your Results window. Click on the main Stata window to get the Results window back on top. Want to see the graph again? Click on the **Graph** button, . See [The Graph button in \[GSW\] 14 Graphing data](#) for more information about the **Graph** button.

We would now like to see how the different correlations for foreign and domestic cars are manifested in scatterplots. It would be nice to see a scatterplot for each type of car, along with a scatterplot for all the data.

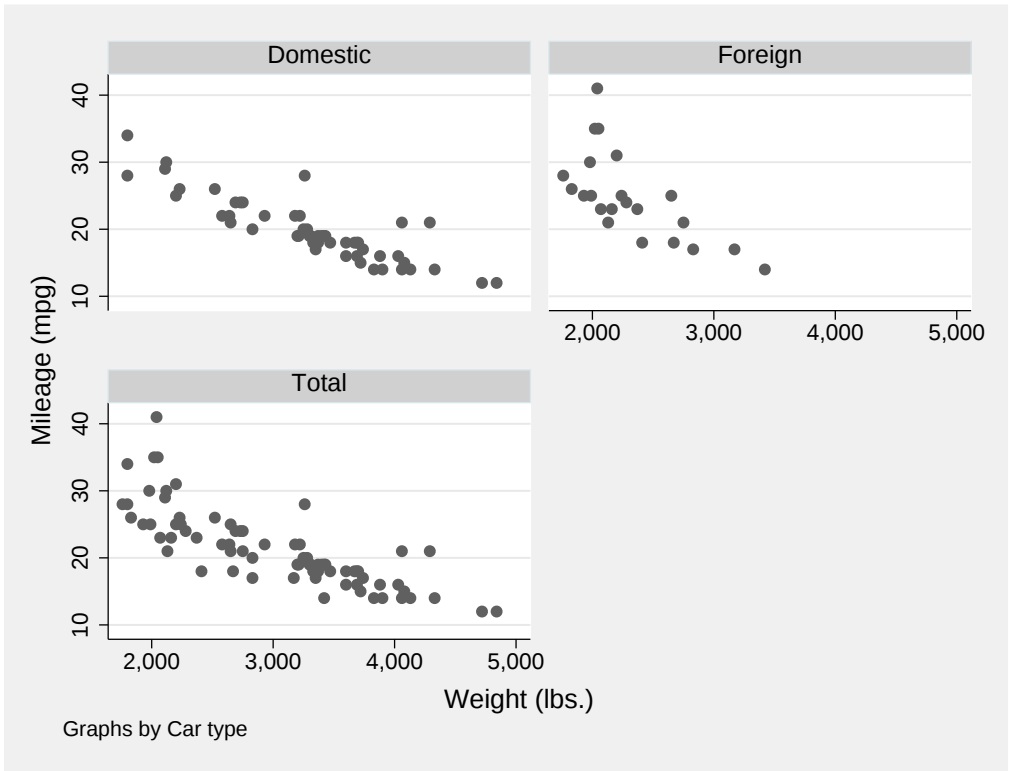
Syntax note: Because we are looking at subgroups, this looks like it is a job for `by`. We want one graph—think about whether it should be a `by()` option or a `by` prefix.

Start as before:

1. Select **Graphics > Twoway graph (scatter, line, etc.)** from the menus.
2. If *Plot 1* is displayed under the *Plot definitions*, and `(scatter mpg weight)` appears below the *Plot definitions* box, select it and skip to step 4.
3. Go through the process on the previous page to create the graph.
4. Click on the **By** tab.
5. Check the *Draw subgraphs for unique values of variables* checkbox.
6. Enter `foreign` in the *Variables* field.
7. Check the *Add a graph with totals* checkbox.
8. Click on the **Submit** button.

The command and the associated graph are

```
. twoway (scatter mpg weight), by(foreign, total)
```



The graphs show that the relationship is nonlinear for both types of cars.

Syntax note: This is another use of a `by()` option. If you had used a `by` prefix, two separate graphs would have been generated.

Model fitting: Linear regression

After looking at the graphs, we would like to fit a regression model that predicts MPG from the weight and type of the car. From the graphs, the relationship is nonlinear and so we will try modeling MPG as a quadratic in weight. Also from the graphs, we judge the relationship to be different for domestic and foreign cars. We will include an indicator (dummy) variable for foreign and evaluate afterward whether this adequately describes the difference. Thus we will fit the model

$$\text{mpg} = \beta_0 + \beta_1 \text{weight} + \beta_2 \text{weight}^2 + \beta_3 \text{foreign} + \epsilon$$

`foreign` is already an indicator (0/1) variable, but we need to create the weight-squared variable. This can be done via the menus, but here using the command line is simpler:

```
. generate wtsq = weight^2
```

Now that we have all the variables we need, we can run a linear regression. We will use the menus and see that the command is also simple. To use the menus, select **Statistics > Linear models and related > Linear regression**. In the resulting dialog, choose `mpg` as the *Dependent variable* and `weight`, `wtsg`, and `foreign` as the *Independent variables*. **Submit** the command. Here is the equivalent simple `regress` command and the resulting analysis-of-variance table.

```
. regress mpg weight wtsg foreign
```

Source	SS	df	MS			
Model	1689.15372	3	563.05124	Number of obs = 74		
Residual	754.30574	70	10.7757963	F(3, 70) = 52.25		
Total	2443.45946	73	33.4720474	Prob > F = 0.0000		

	R-squared = 0.6913		
	Adj R-squared = 0.6781		
	Root MSE = 3.2827		

mpg	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
weight	-.0165729	.0039692	-4.18	0.000	-.0244892	-.0086567
wtsg	1.59e-06	6.25e-07	2.55	0.013	3.45e-07	2.84e-06
foreign	-2.2035	1.059246	-2.08	0.041	-4.3161	-.0909002
_cons	56.53884	6.197383	9.12	0.000	44.17855	68.89913

The results look encouraging, so we will plot the predicted values on top of the scatterplots for each of the types of cars. To do this, we need the predicted, or fitted, values. This can be done via the menus, but doing it by hand is simple enough. We will create a new variable, `mpghat`:

```
. predict mpghat
(option xb assumed; fitted values)
```

The output from this command is simply a notification. Go over to the Variables window and scroll to the bottom to confirm that there is now an `mpghat` variable. If you were to try this command when `mpghat` already exists, Stata will refuse to overwrite your data:

```
. predict mpghat
mpghat already defined
r(110);
```

The `predict` command, when used after a regression, is called a *postestimation command*. As specified, it creates a new variable called `mpghat` equal to

$$-0.0165729\text{weight} + 1.59 \times 10^{-6}\text{wtsg} - 2.2035\text{foreign} + 56.53884$$

For careful model fitting, there are several features available to you after estimation—one is calculating predicted values. Be sure to read [U] 20 Estimation and postestimation commands.

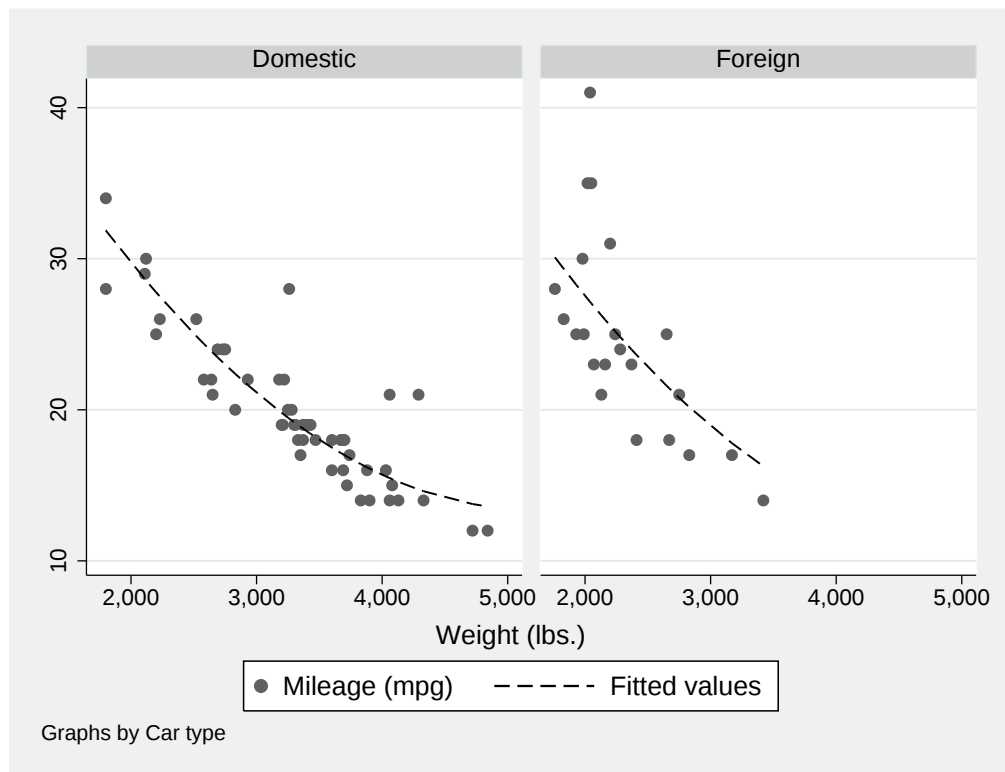
We can now graph the data and the predicted curve to evaluate the fit on the foreign and domestic data separately to determine if our shift parameter is adequate. We can draw both graphs together. Using the menus and a dialog, do the following:

- 1. Select **Graphics > Twoway graph (scatter, line, etc.)** from the menus.
- 2. If there are any plots listed, click on the **Reset** button, .

3. Create the graph for mpg versus weight.
 - a. Click on the **Create...** button.
 - b. Be sure that *Basic plots* and *Scatter* are selected.
 - c. Select mpg as the *Y variable* and weight as the *X variable*.
 - d. Click on **Accept**.
 4. Create the graph showing mpghat versus weight.
 - a. Click on the **Create...** button.
 - b. Select *Basic plots* and *Line*.
 - c. Select mpghat as the *Y variable* and weight as the *X variable*.
 - d. Check the *Sort on x variable* box. Doing so ensures that the lines connect from smallest to largest weight values, instead of the order in which the data happen to be.
 - e. Click on **Accept**.
 5. Show two plots, one each for domestic and foreign cars, on the same graph.
 - a. Click on the **By** tab.
 - b. Check the *Draw subgraphs for unique values of variables* checkbox.
 - c. Enter foreign in the *Variables* field.
 6. Click on the **Submit** button.
- Here are the resulting command and graph:

(Continued on next page)

```
. twoway (scatter mpg weight) (line mpghat weight, sort), by(foreign)
```

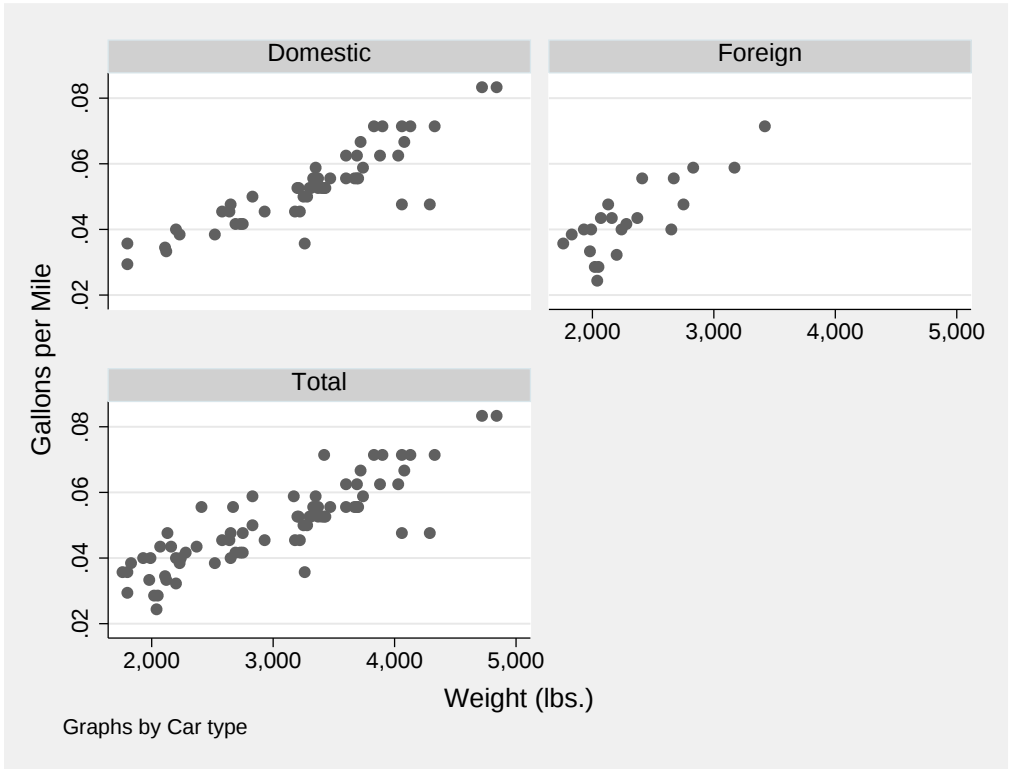


Here we can see the reason for enclosing the separate `scatter` and `line` commands in parentheses: they can then be overlaid by submitting them together. The fit of the plots looks good and is cause for initial excitement. So much excitement, in fact, that we decide to print the graph and show it to an engineering friend. We print the graph, being careful to print the graph and not all our results: **File > Print...** from the Graph window menu bar.

When we show our graph to our engineering friend, she is concerned. “No,” she says. “It should take twice as much energy to move 2,000 pounds 1 mile compared with moving 1,000 pounds the same distance, and therefore it should consume twice as much gasoline. Miles per gallon is not a quadratic in weight; gallons per mile is a linear function of weight. Don’t you remember any physics?”

We try out what she says. We need to generate a gallons-per-mile variable and make a scatterplot. Here are the commands that we would need—note their similarity to commands issued earlier in the session. There is one new command, the `label variable` command, which allows us to give the `gpm` variable a *variable label* so that the graph is labeled nicely.

```
. generate gpm = 1/mpg
. label variable gpm "Gallons per Mile"
. twoway (scatter gpm weight), by(foreign, total)
```



Sadly satisfied that the engineer is indeed correct, we rerun the regression:

```
. regress gpm weight foreign
```

Source	SS	df	MS	Number of obs = 74		
Model	.009117618	2	.004558809	F(2, 71) = 113.97		
Residual	.00284001	71	.00004	Prob > F = 0.0000		
Total	.011957628	73	.000163803	R-squared = 0.7625		
				Adj R-squared = 0.7558		
				Root MSE = .00632		
gpm	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
weight	.0000163	1.18e-06	13.74	0.000	.0000139	.0000186
foreign	.0062205	.0019974	3.11	0.003	.0022379	.0102032
_cons	-.0007348	.0040199	-0.18	0.855	-.0087504	.0072807

(Continued on next page)

We find that foreign cars had better gas mileage than domestic cars in 1978 because they were so light. According to our model, a foreign car with the same weight as a domestic car would use an additional 1/160 gallon per mile driven. With this, we are satisfied with our analysis.

Commands versus menus

In this chapter, you have seen that Stata can operate either via menu choices and dialog boxes or via the Command window. As you become more familiar with Stata, you will find that the Command window is typically much faster for often-used commands, whereas the menus and dialogs are faster when building up complex commands, such as graphs.

One of Stata's great strengths is the consistency of its *command syntax*. Most of Stata's commands share the following syntax, where square brackets mean that something is optional and a *varlist* is a list of variables.

[*prefix*:] *command* [*varlist*] [*if*] [*in*] [*weight*] [, *options*]

Some general rules:

- Most commands accept prefix commands that modify their behavior; see [U] 11.1.10 **Prefix commands** for details. One of the more common prefix commands is *by*.
- If an optional *varlist* is not specified, all the variables are used.
- *if* and *in* restrict the observations on which the command is run.
- *options* modify what the command does.
- Each command's syntax is found in the online help and the reference manuals.
- Stata's command syntax includes more than we have shown you here, but this should get you started. For more information, see [U] 11 **Language syntax** and `help language`.

We saw examples using all the pieces of this except for the *in* qualifier and the *weight* clause. The syntax for all commands can be found in the online help along with examples—see [GSW] 4 **Getting help** for more information. The consistent syntax makes it straightforward to learn new commands and to read others' commands when examining an analysis.

Here is an example of reading the syntax diagram by using the `summarize` command from earlier in this chapter. The syntax diagram for `summarize` is typical:

`summarize` [*varlist*] [*if*] [*in*] [*weight*] [, *options*]

This means that

<i>command</i> by itself is valid:	<code>summarize</code>
<i>command</i> followed by a <i>varlist</i> (variable list) is valid:	<code>summarize mpg</code> <code>summarize mpg weight</code>
<i>command</i> with <i>if</i> (with or without a <i>varlist</i>) is valid:	<code>summarize if mpg>20</code> <code>summarize mpg weight if mpg>20</code>
and so on.	

You can learn about `summarize` in [R] **summarize**, or select **Help > Stata Command...** and enter `summarize`, or type `help summarize` in the Command window.

Keeping track of your work

It would have been useful if we had made a log of what we did so that we could conveniently look back at interesting results or track any changes that were made. You will learn to do this in [\[GSW\] 16 Saving and printing results by using logs](#). Your logs will contain commands and their output—another reason to learn command syntax, so that you can remember what you have done.

To make a log file that keeps track of everything appearing in the Results window, click on the button that looks like a lab notebook, . Choose a place to store your log file, and give it a name, just as you would any other document. The log file will save everything that appears in the Results window from the time you start a log file to the time that you close it.

Conclusion

This chapter introduced you to Stata's capabilities. You should now read and work through the rest of this manual. Once you are done here, you can read the *User's Guide*.

Notes

2 The Stata user interface

The windows

This chapter introduces the core of Stata’s interface: its main windows, its toolbar, its menus, and its dialog boxes.

Past commands appear here

Variable list appears here

Results are displayed here

Current working directory appears here

Commands are typed here

Current log status appears here

Command log status appears here

Source	SS	df	MS
Model	.008729651	1	.008729651
Residual	.003227977	72	.000044833
Total	.011957628	73	.000163803

	Coef.	Std. Err.	t	P> t	[95% conf. Interval]
gpm	.0000141	1.01e-06	13.95	0.000	.0000121 .0000161
_cons	.0077077	.0031426	2.45	0.017	.0014431 .0139723

The four main windows are the Review, Variables, Results, and Command windows. These are initially contained in the main Stata window. Each has its name in its title bar. These four windows are typically in use the whole time Stata is open. There are other, more specialized windows, such as the Viewer, Data Editor, Variables Manager, Do-file Editor, Graph, and Graph Editor windows—these are discussed later in this manual.

To open any window, or to reveal a window hidden by other windows, select the window from the **Window** menu or select the proper item from the toolbar. You can also use *Ctrl+Tab* to cycle through all open Stata windows. Many of Stata’s windows have functionality that can be accessed by clicking on the right mouse button (right-clicking) within the window. Right-clicking displays a contextual menu that, depending on the window, allows you to copy text, set the preferences for the window, or print the contents of the window. When copying text or printing, we recommend that you always right-click on the window rather than use the menu bar or toolbar so that you can be sure of where and what you are copying or printing.

The toolbar

This is the toolbar:



The toolbar contains buttons that provide quick access to Stata's more commonly used features. If you forget what a button does, hold the mouse pointer over a button for a moment and a tooltip will appear with a description of that button. Buttons that contain both an icon and an arrow display a menu if you click on the arrow.



Open: Open a Stata dataset. Click on the button to open a dataset with the **Open** dialog. Hold down the button to select a dataset from a menu of recently opened datasets.



Save: Save the Stata dataset currently in memory to disk.



Print Results: Print the Results window. Click on the arrow to select a window to print.



Log: Begin a new log or close, suspend, or resume the current log. See [\[GSW\] 16 Saving and printing results by using logs](#) for an explanation of log files.



Viewer: Open the Viewer, or bring a Viewer to the front of all other windows. Click on the button to open a new Viewer. Click on the arrow to select a Viewer to bring to the front. See [\[GSW\] 3 Using the Viewer](#) for more information.



Graph: Bring a Graph window to the front of all other windows. Click on the button to bring the topmost Graph window to the front. Click on the arrow to select a Graph window to bring to the front. See [The Graph button](#) in [\[GSW\] 14 Graphing data](#) for more information.



Do-file Editor: Open the Do-file Editor, or bring a Do-file Editor to the front of all other windows. Click on the button to open a new Do-file Editor. Click on the arrow to select a Do-file Editor to bring to the front. See [\[GSW\] 13 Using the Do-file Editor—automating Stata](#) for more information.



Data Editor (Edit): Open the Data Editor, or bring the Data Editor to the front of the other Stata windows. See [\[GSW\] 6 Using the Data Editor](#) for more information.



Data Editor (Browse): Open the Data Editor in browse mode. [Browse mode](#) in [\[GSW\] 6 Using the Data Editor](#) for more information.



Variables Manager: Open the Variables Manager. See [\[GSW\] 7 Using the Variables Manager](#) for more information.



Clear —more— Condition: Tell Stata to continue when it has paused in the middle of long output. See [\[GSW\] 10 Listing data and basic command syntax](#) for more information.



Break: Stop the current task in Stata. See [\[GSW\] 10 Listing data and basic command syntax](#) for more information.

The Command window

Commands are submitted to Stata from the Command window. The Command window supports basic text editing, copying and pasting, a command history, function-key mapping, and variable-name completion. From the Command window, pressing

<i>Page Up</i>	steps backward through the command history.
<i>Page Down</i>	steps forward through the command history.
<i>Tab</i>	auto-completes a partially typed variable name, if possible.

See [\[U\] 10 Keyboard use](#) for more information about keyboard shortcuts for the Command window.

The command history allows you to recall a previously submitted command, edit it if you wish, and then resubmit it. Commands submitted by Stata's dialogs are also included in the command history, so you can recall and submit a command without having to open the dialog again.

The Review window

The Review window shows the history of commands that have been entered, displaying successful commands in black and unsuccessful commands, along with their error codes, in red. To enter a command from the Review window, you can

- Click once on a past command to copy it to the Command window, replacing the contents of the Command window.
- Double-click on a past command to execute it. (Executing the command adds the command to the bottom of the Review window, also.)

Right-clicking on the Review window displays a menu from which you can select

- **Cut** to remove the selected command(s) from the Review window and place it on the Clipboard.
- **Copy** to copy the selected command(s) to the Clipboard.
- **Delete** to remove the selected command(s) from the Review window.
- **Select All** to select all the commands in the Review window, including those before and after the commands currently displayed.
- **Clear All** to clear out all the commands from the Review window, including those before and after the commands currently displayed.
- **Do Selected** to submit all the selected commands and add them to the bottom of the command history. Stata will attempt to run all the selected commands, even those containing errors, and will not stop even if a command causes an error.
- **Send to Do-file Editor** to place all the selected commands into a new Do-file Editor window.
- **Save All...** to bring up a *Save Review Contents* dialog, allowing you to save all the commands in the Review window, including those before and after the commands currently displayed, in a *do-file*. (See [\[GSW\] 13 Using the Do-file Editor—automating Stata](#) for more information on *do-files*.)
- **Save Selected...** to bring up a *Save Review Contents* dialog, allowing you to save the selected commands in the Review window in a *do-file*.
- **Font...** to bring up a *Font* dialog, allowing you to change the font used to display the Review window contents.

The Variables window

The Variables window shows the list of variables, along with their labels, storage types, and display formats, for the dataset in memory. Click once on a variable in the Variables window to paste it onto the end of whatever is in the Command window. Double-clicking on a variable is like clicking on the variable once. Right-clicking on a variable in the Variables window displays a menu from which you can select

- **Rename** ‘*varname*’... to rename *varname*.
- **Edit Variable Label for** ‘*varname*’... to change the variable label for *varname*.
- **Format** ‘*varname*’... to change the display format for *varname*.
- **Drop** ‘*varname*’... to drop, or eliminate, *varname* from the dataset in memory. You will be asked for confirmation. This affects only the dataset in memory, not the dataset as saved on your disk. See [\[GSW\] 12 Deleting variables and observations](#) for more information.
- **Manage Notes for** ‘*varname*’... to add, edit, or drop notes attached to variable *varname*. See [Managing notes](#) in [\[GSW\] 7 Using the Variables Manager](#) for more information.
- **Manage Notes for Data...** to add, edit, or drop notes attached to the dataset.
- **Font...** to bring up a *Font* dialog, allowing you to change the font used to display the Variables window contents.

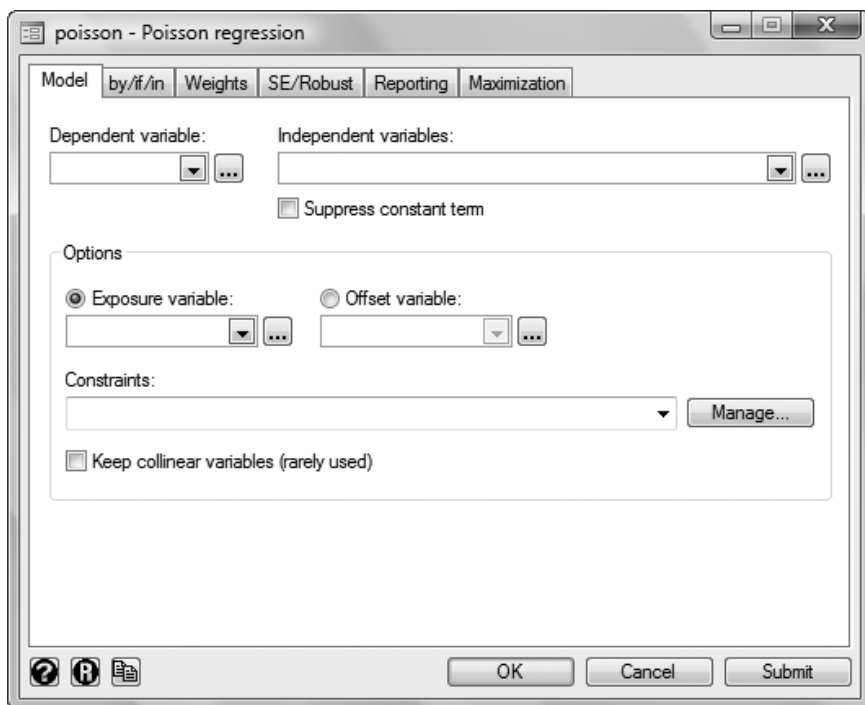
Items from the contextual menu issue standard Stata commands, so working by right-clicking is just like working directly in the Command window. You should also investigate the Variables Manager, explained in [\[GSW\] 7 Using the Variables Manager](#), because it extends these capabilities and provides a good interface for managing variables.

Menus and dialogs

There are two ways by which you can tell Stata what you would like it to do: you can use menus and dialogs, or you can use the Command window. When you worked through the sample session in [\[GSW\] 1 Introducing Stata—sample session](#), you saw that both have strengths. We will discuss the menus and dialogs here.

Stata’s **Data**, **Graphics**, and **Statistics** menus provide point-and-click access to almost every command in Stata. As you will learn, Stata is fully programmable, and Stata programmers can even create their own dialogs and menus. The **User** menu provides a place for programmers to add their own menu items. Initially, it contains only some empty submenus.

If you wish to perform a Poisson regression, for example, you could type Stata's `poisson` command, or you could select **Statistics > Count outcomes > Poisson regression**, which would display this dialog:



This dialog provides access to all the functionality of Stata's `poisson` command. The `poisson` command has many options that can be accessed by clicking on the multiple tabs across the top of the dialog. The first time you use the dialog for a command, it is a good idea to look at the contents of each tab so that you will know all the dialog's capabilities.

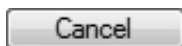
The dialogs for many commands have the **by/if/in** and **Weights** tabs. These provide access to Stata's commands and qualifiers for controlling the estimation sample and dealing with weighted data. See [\[U\] 11 Language syntax](#) for more information on these features of Stata's language.

The dialogs for most estimation commands have the **Maximization** tab for setting the maximization options (see [\[R\] maximize](#)). For example, you can specify the maximum number of iterations for the optimizer.

Most dialogs in Stata provide the same six buttons you see at the bottom of the Poisson dialog above.

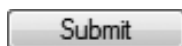


OK issues a Stata command based on how you have filled out the fields in the dialog and then closes the dialog.



Cancel closes the dialog without doing anything—just as clicking on the red close button does.

(Continued on next page)



Submit issues a command just like **OK** but leaves the dialog on the screen so that you can make changes and issue another command. This feature is handy when, for example, learning a new command or putting together a complicated graph.



Help provides access to Stata's help system. Clicking on this button will typically take you to the help file for the Stata command associated with the dialog. Clicking on it here would take you to the `poisson` help file. The help file will have tabs above groups of options to show which dialog tab contains which options.



Reset resets the dialog to its default state. Each time you open a dialog, it will remember how you last filled it out. If you wish to reset its fields to their default values at any time, simply click on this button.



Copy Command to Clipboard behaves much like the **Submit** button, but rather than issuing a command, it copies the command to the Clipboard. The command can then be pasted elsewhere (such as the Do-file Editor).

The command issued by a dialog is submitted just as if you typed it by hand. You can see it in the Results window and the Review window after it executes. Looking carefully at the full command will help you learn Stata's command syntax.

In addition to being able to access the dialogs for Stata commands through Stata's menus, you can also invoke them by using two other methods. You may know the name of a Stata command for which you want to see a dialog, but you may not remember how to navigate to that command in the menu system. Simply type `db commandname` to launch the dialog for *commandname*:

```
. db poisson
```

You will also find access to the dialog for a command in that command's help file; see [\[GSW\] 4 Getting help](#) for more details.

As you read this manual, we will present examples of Stata commands. You may type those examples as presented, but you should also experiment with submitting those commands by using their dialogs. Use the `db` command described above to quickly launch the dialog for any command that you see in this manual.

The working directory

If you look at the screen shot on page [25](#) you will notice the status bar at the base of the main Stata window that contains the current working directory, which you set when you installed Stata. We will use the directory `C:\Users\mydir\Documents` in our examples; your exact directory will differ. The current working directory is the folder where graphs and datasets will be saved when typing commands such as `save filename`. It does not affect the behavior of menu-driven file actions such as **File > Save** or **File > Open....** Once you have started Stata, you can change the current working directory with the `cd` command. See [\[D\] cd](#) for full details. Stata always displays the name of the current working directory so that it is easy to tell where your graphs and datasets will be saved.

Fine control of Stata's windows

When Stata is first launched, the Review, Variables, Results, and Command windows appear within the main Stata window. The Review, Variables, and Command windows are initially linked to each other and attached to the edges of the Stata window. They cannot be moved, though they can be resized by dragging on their edges.

The Results window is maximized by default, which locks it into whatever space remains inside the main Stata window. If you unmaximize the window, it can be moved around inside the main Stata window but cannot be moved outside the main Stata window.

All other windows that open up can be moved freely and independently of the Stata window.

This default behavior is simple and familiar, but it can be modified to suit your work style and the size of your screen. The following sections explain how you can adjust window behavior to suit your fancy.

Window types

The Stata for Windows interface has two types of windows: *docking* and *nondocking*. The Review, Variables, Command, and Viewer windows are docking windows. All other windows are nondocking.

Docking windows are those that have special characteristics that allow them to be used with other docking windows: they can be *linked* (sharing a window with a splitter dividing the windows) or *tabbed* (sharing a window with a tab for each). They can be set to automatically hide when not needed. Nondocking windows have none of these special characteristics.

Here is brief comparison between the two types of windows:

Docking windows

- can be dragged in and out of the main Stata window or other docking windows,
- can be linked to other docking windows so that they share a window with a splitter dividing them,
- can share one window with other docking windows with a tab for each, and
- can be made to hide automatically when not in use.

Nondocking windows

- are separate from the main Stata window (except for the Results window),
- cannot be linked to other windows,
- cannot be tabbed to another window,
- cannot be made to hide automatically when not in use, and
- can be made to always appear in front of the main Stata window.

When Stata is first launched, the Review, Variables, Results, and Command windows appear within the main Stata window. The Review, Variables, and Command windows are docking windows and are initially both docked and linked to each other. The Results window is a nondocking window.

Docking windows

To allow docking windows to have extra features, you first need to select **Edit > Preferences > General Preferences...**, click on the **Windowing** tab, and check *Enable dockable windows*. Until this is selected, the Review, Variables, and Command windows will remain docked on the edges of the main Stata window.

Docking windows can be dragged into (docked) and out of (undocked) the main Stata window or other docking windows. When you drag a docking window, a transparent blue box appears in place of the window. If you drag the box over the main Stata window or another docking window, docking guides appear (see figure 1). Dragging the box over a guide previews how and where the window will appear if you release the mouse button. Releasing the mouse button (dropping) when the box is over a guide (dropping) links the window as previewed, whereas releasing it when the box is not on a docking guide simply moves the window to that position.

Dropping the box on one of the outer docking guides links the docking window to the window under the guide. For example, figure 1 shows how you would drag the Review window over the Variables window, at which point the docking guides appear. When you move the mouse over the bottom docking guide and release the mouse button, the Review window becomes linked to the Variables window and is displayed in the lower part of the window.

When docking windows are linked, a divider (splitter) is inserted between them. The splitter allows the linked windows to be resized; increasing the size of one window decreases the size of the other. To prevent splitters from resizing linked windows, select **Edit > Preferences > General Preferences...**, click on the **Windowing** tab, and check *Lock splitters*. To undock a linked window, double-click on the window's title bar, or drag the window away from the other window.

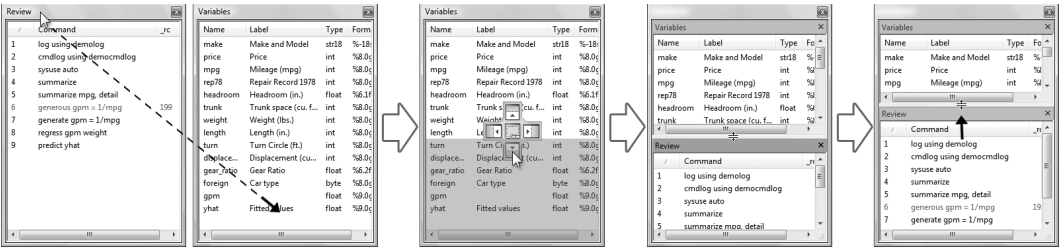


Figure 1: Linking two windows

Dropping the box on the center docking guide (see figure 2) combines the docking window with the window under the guide. One docking window is created with a tab for each docked window at the bottom of the new window. Clicking on a tab displays its window. To undock a tabbed window, double-click on the window's tab, or click and drag the window's tab out of the docking window. The docking window containing the tabbed windows can also be linked to other docking windows.

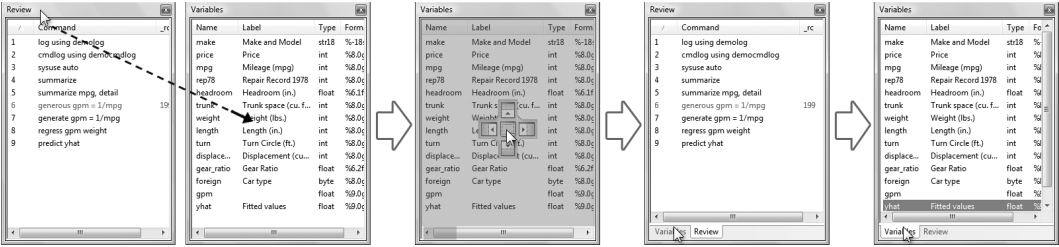


Figure 2: Docking two windows

Auto Hide and pinning

Docking windows support the Auto Hide feature, which automatically hides the docking windows when they are not in use. This feature is turned off by default. To enable this feature, select **Edit > Preferences > General Preferences...**, click on the **Windowing** tab, and check *Enable auto-hide windows (pin/unpin)*. When this feature is enabled, a pushpin will appear in the title bar of all docked docking windows.

To enable Auto Hide for a docking window, click on the pushpin in the title bar (see figure 3) so that the pushpin points left. Click on the pushpin again to disable Auto Hide; the pushpin will point down.

After you enable Auto Hide for a docking window, the window is hidden when not in use and is displayed as a tab along an edge of the main Stata window. To show the window, move the mouse pointer over the tab. To hide the window again, move the mouse pointer outside the window. If the window has the focus (its title bar is highlighted), it will be hidden if you click on another window. Auto Hide works only on docking windows that are docked within the main Stata window.

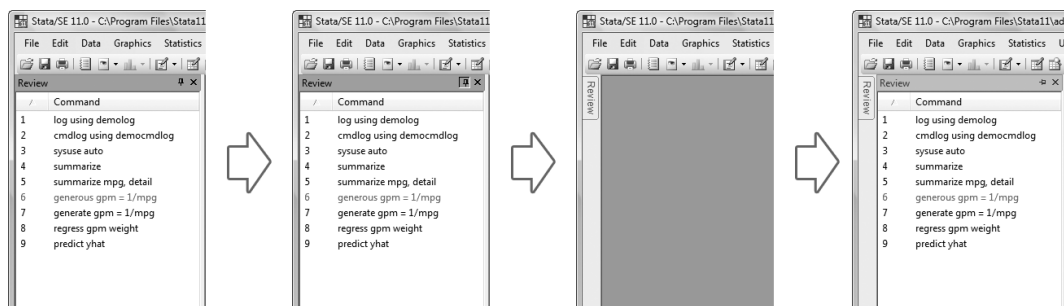


Figure 3: Enabling Auto Hide

When you undock a docking window, you can move it in front of or behind other Stata windows, including the main Stata window. If you click on any part of the main Stata window, the main window will move to the front and obscure the undocked window. You can bring the undocked window back to the front by selecting it from the **Window** menu. Or you can just make undocked windows always appear in front of the main Stata window (float) by selecting **Edit > Preferences > General Preferences...**, clicking on the **Windowing** tab, and checking *Float dialogs and dockable windows*.

In addition to dragging the window, you can dock or undock a docking window by double-clicking on its title bar. You can double-click on the title bar again to move the window back to its previously docked or undocked location.

If you enable Auto Hide for the Review and Variables windows in their default docked location, they will obscure any text at the beginning of the Command window when they are displayed. To avoid this problem, dock these two windows at the right edge of the main Stata window before enabling Auto Hide.

Nondocking windows

Nondocking windows can be dragged in and out of the main Stata window but do not share any of the other special features of docking windows, such as linking and tabbing. Nondocking windows include the Graph window, Data Editor, Do-file Editor, and dialogs. The Results window, because of its status as the primary window of Stata, must remain inside the main Stata window.

As with docking windows, the main Stata window, when brought to the front, can obscure nondocking windows that exist outside the main window. To prevent this, select **Edit > Preferences > General Preferences...**, click on the **Windowing** tab, and check *Float dialogs and dockable windows*. This setting makes both undocked docking windows and nondocking windows always appear in front.

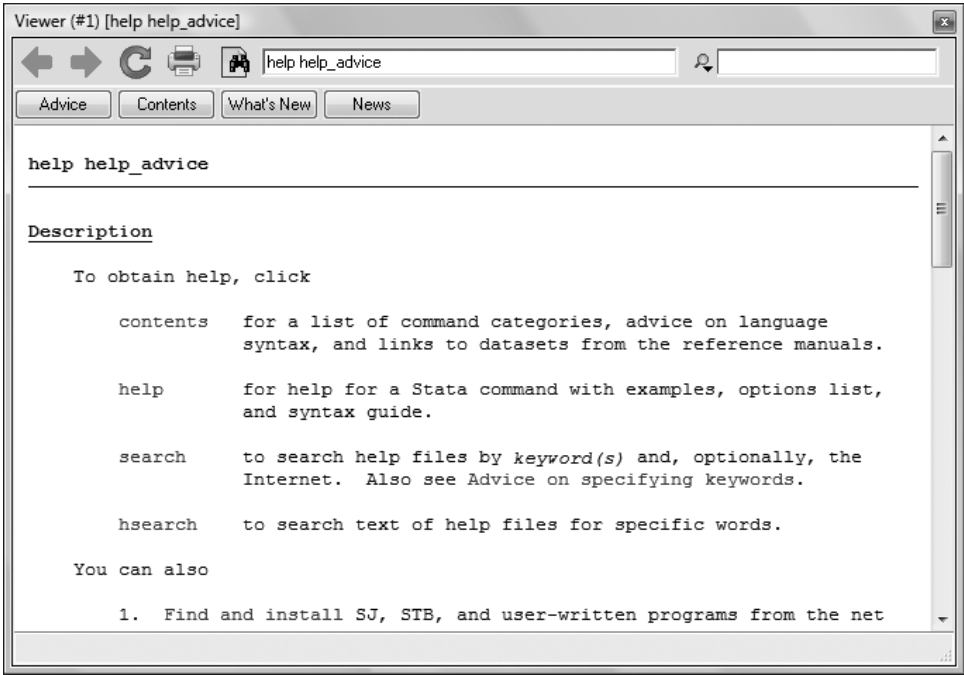
3 Using the Viewer

The Viewer's purpose

The Viewer is a versatile tool in Stata. It will be the first place you can turn for help within Stata, but it is far more than just a help system. You can also use the Viewer to keep your copy of Stata current; add, delete, and manage third-party extensions to Stata known as *user-written programs*; view and print Stata logs both from your current and previous Stata sessions; view and print any other Stata-formatted (SMCL) or plain-text (ASCII) file; and even launch your web browser to follow hyperlinks.

This chapter focuses on the general use of the Viewer, its buttons, and a brief summary of the commands that the Viewer understands. There is more information about using the Viewer to find help in [GSW] 4 Getting help and for maintaining your copy of Stata in [GSW] 19 Updating and extending Stata—Internet functionality.

To open a new Viewer window, you can either click on the **Viewer** button, , or select **Window > Viewer > New Viewer**. A Viewer opened in this fashion provides links that allow you to perform several tasks.



(Continued on next page)

Viewer buttons

The toolbar of the Viewer has multiple buttons, a command box, and a search box.



Back: Goes back one step in your viewing trail.



Forward: Goes forward one step in your viewing trail, assuming you had backtracked.



Refresh: Refreshes the Viewer, in case you are viewing something that has changed since you opened the Viewer.



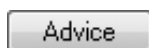
Print: Prints the contents of the Viewer.



Find: Toggles the Find bar at the bottom of the Viewer (see below).



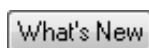
Search: Chooses the scope of help searches in the Viewer.



Advice: Gives some advice on getting help.



Contents: Shows a brief topics table of contents for the help system with links to each major category.

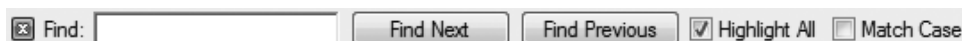


What's New: Lists additions and fixes made to Stata since the initial release of version 11.



News: Lists recent news and information of interest to Stata users.

The Find bar is used to find text within the current Viewer. To reveal the Find bar at the bottom of the window, click on the **Find** button (see above):



The Find bar has its own buttons, fields, and checkboxes.



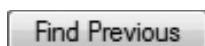
Close: Closes the Find bar.



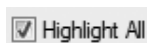
Find: The field for entering the search text you would like to find.



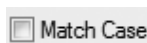
Find Next: Jumps to the next instance of the search text. Automatically wraps past the end of the Viewer document if there are no further instances of the search text.



Find Previous: Jumps to the previous instance of the search text. Automatically wraps past the start of the Viewer document if there are no previous instances of the search text.



Highlight All: If checked, highlights other instances of the search text (in yellow, by default). If unchecked, only the current instance of the search text is highlighted (in black, by default). By default, this is checked.



Match Case: If checked, uppercase and lowercase letters are considered different, so searching for **This** would not find **this**. If unchecked, uppercase and lowercase letters are considered the same, so searching for **This** would find **this**. By default, this box is unchecked.

Viewer's function

The Viewer is similar to a web browser. It has clickable links (shown in blue text) that you can follow to related help topics, to install and manage third-party software, and even to keep your copy of Stata up to date. When you move the mouse pointer over a link, the status bar at the bottom of the Viewer shows the action associated with that link. If the action of a link is `help logistic`, clicking on that link will show the help file for the `logistic` command in the Viewer. Middle-clicking on a link in a Viewer window (if you do not have a three-button mouse, then *Shift*+clicking will open the link in a new Viewer window.

You can open a new Viewer by selecting **Window > Viewer > New Viewer** or clicking on the Viewer button on the toolbar, or by right-clicking on an existing Viewer window and selecting **Open New Viewer**. Entering a `help` command from the Command window will also open a new Viewer.

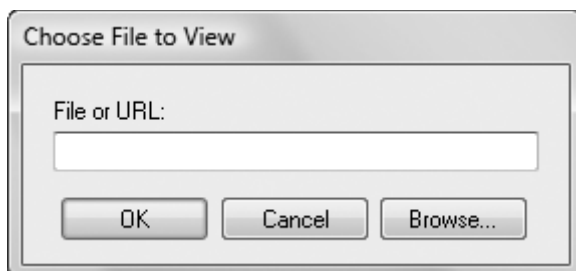
To bring a Viewer to the front of all other Viewers, select **Window > Viewer** and choose a Viewer from the list there. Selecting **Close All Viewers** closes all open Viewer windows.

The Viewer is a docking window (see [GSW] 2 [The Stata user interface](#)). A Viewer that is docked with the main Stata window when Stata is exited will be opened automatically the next time Stata is started. To also make undocked Viewers automatically open, select **Edit > Preferences > General Preferences...**, click on the **Windowing** tab, and check *Make undocked Viewers persistent*.

A Viewer that is automatically opened initially displays the Viewer help file. You can make it display the same contents it displayed when it was last open by selecting **Edit > Preferences > General Preferences...**, clicking on the **Windowing** tab, and checking *Persistent Viewers retain topics*.

Viewing local text files, including SMCL files

In addition to viewing built-in Stata help files, you can use the Viewer to view Stata Markup and Control Language (SMCL) files, such as those typically produced when logging your work (see [GSW] 16 [Saving and printing results by using logs](#)) and plain-text files. To open a file and view its contents, simply select **File > View...**, and you will be presented with a dialog:



You may either type in the name of the file that you wish to view and click on **OK**, or you may click on the **Browse...** button to open a standard file dialog that allows you to navigate to the file.

If you currently have a log file open, you may view the log file in the Viewer. This method has one advantage over scrolling back in the Results window: what you view stays fixed even as output is added to the Results window. If you wish to view a current log file, select **File > Log > View...**, and the usual dialog will appear, but with the path and filename of the current log already in the field. Simply click on **OK**, and the log will appear in the Viewer. See [GSW] 16 **Saving and printing results by using logs** for more details.

Viewing remote files over the Internet

If you want to look at a remote file over the Internet, the process is similar to viewing a local file, only instead of using the **Browse...** button, you type the URL of the file that you want to see, such as <http://www.stata.com/man/readme.smcl>. You should use the Viewer only to view text or SMCL files. If you enter the URL of, say, an arbitrary web page, you will see the HTML source of the page instead of the usual browser rendering.

Navigating within the Viewer

In addition to using the window scrollbar to navigate the Viewer window, you also can use the up/down cursor keys and *Page Up/Page Down* keys to do the same. Pressing the up/down cursor keys scrolls the window a line at a time. Pressing the *Page Up/Page Down* keys scrolls the window a screenful at a time.

Printing

To print the contents of the Viewer, right-click on the window, and select **Print...** You may also select **File > Print > viewer name** or click on the arrow of the **Print** toolbar button to select from a menu of open windows to print.

Right-clicking on the Viewer window

Right-clicking on the Viewer window displays a contextual menu from which you can do many of the tasks listed above.

- **Back** to go back one step in your viewing trail.
- **Forward** to go forward one step in your viewing trail, assuming you had backtracked.
- **Open New Viewer** to open a new Viewer.
- **Open Link in New Viewer** to open a link in a new Viewer (as long as you right-clicked on the link itself).
- **Close All Viewers But This One** to close all other Viewer windows.
- **Copy** to copy highlighted text to the Clipboard.
- **Copy Table** to copy a table to the Clipboard in tab-delimited format.
- **Copy Table as HTML** to copy a table to the Clipboard in HTML format, i.e., a format usable on a web page. Copying a nontable as HTML is the same as using the **Copy** menu item.
- **Copy as Picture** to copy selected text in the Viewer window as a picture in WMF format.
- **Select All** to select all text in the Viewer.

- **Find in Viewer...** to find text in the Viewer by using the Find bar.
- **Preferences...** to edit the preferences for the Viewer window.
- **Font...** to change the font for the window.
- **Print...** to print the contents of the Viewer window.

Searching for help in the Viewer

The *search box* in the Viewer can be used to search documentation. Click on the magnifying glass; choose *Search documentation and FAQs*, *Search net resources*, or *Search all*; and then type a word or phrase in the search window and press *Enter*. For more extensive information about using the Viewer for help, see [GSW] 4 [Getting help](#).

Commands in the Viewer

Everything you can do in the Viewer by clicking on links and buttons can also be done by typing commands in the *command box* at the top of the window or on the Stata command line. Some of the commands that can be issued in the Viewer are

1. *Obtaining help* (see [GSW] 4 [Getting help](#))
 - Type `contents` to view the contents of Stata's help system.
 - Type `commandname` to view the help file for a Stata command.
2. *Searching* (see [GSW] 4 [Getting help](#))
 - Type `search keyword` to search documentation and FAQs on a topic.
 - Type `search keyword, net` to search net resources on a topic.
 - Type `search keyword, all` to search both of the above.
3. *User-written programs* (see [GSW] 4 [Getting help](#) and [GSW] 19 [Updating and extending Stata—Internet functionality](#))
 - Type `net` from <http://www.stata.com/> to find and install *Stata Journal*, STB, and user-written programs from the net.
 - Type `ado` to review user-written programs you have installed.
 - Type `ado uninstall` to uninstall user-written programs you have installed on your computer.
4. *Updating* (see [Official Stata updates](#) in [GSW] 19 [Updating and extending Stata—Internet functionality](#))
 - Type `update` to check your current Stata version.
 - Type `update query` to check for new official Stata update releases.
 - Type `update all` to update your Stata.
5. *Viewing files in the Viewer*
 - Type `view filename.smcl` to view SMCL files.
 - Type `view filename.txt` to view ASCII files.
 - Type `view filename.log` to view ASCII log files.
6. *Viewing files in the Results window*
 - Type `type filename.smcl` in the Command window to view SMCL files in the Results window.
 - Type `type filename.txt` in the Command window to view ASCII files in the Results window.
 - Type `type filename.log` in the Command window to view ASCII log files in the Results window.

7. *Launching your browser to view an HTML file*

Type `browse URL` to launch your browser.

8. *Keeping informed*

Type `news` to see the latest news from <http://www.stata.com>.

Using the Viewer from the Command window

Stata allows you to print Viewer windows from the Command window. Each Viewer has a unique name (which is displayed in parentheses in the window's title bar) to help identify it from the command line. For example, the name of a Viewer with the window title *Viewer (#1) [help regress]* is `#1`. Its contents can be printed by typing the command `print @Viewer, name(#1)`. Printing in this way does not bring up a print dialog.

Typing `help commandname` in the Command window will bring up a new Viewer showing the requested help.

4 Getting help

Online help

Stata's help system provides a wealth of information to help you learn and use Stata. To find out which Stata command will perform the statistical or data-management task you would like to do, you should generally follow these steps:

1. Select **Help > Search...**, choose *Search documentation and FAQs*, and enter the topic or keyword(s). This search will find information about Stata commands, references to articles in the *Stata Journal* or the *Stata Technical Bulletin* (STB), links to FAQs on Stata's web site, and links to selected external web sites.
2. Read through the **Search** results, and click on the appropriate command name link to open its help file.
3. Read the help file for the command you chose.
4. If you want more in-depth help, click on the link from the name of the command to the PDF documentation, read it, then come back to Stata.
5. If the first help file you went to is not what you wanted, either look at the end of the help file for links to take you to related help files or click on the **Back** button to go back to the previous document and go from there to other help files.
6. With the help file open, click on the Command window and enter the command, or click on one of the dialog links at the top right of the help file to open a dialog for the command.
7. If, at any time, you want to begin again with a new **Search**, enter the new search terms in the search box of the Viewer window.
8. If your *Search documentation and FAQs* search returned no results, you can look for *Stata Journal*, STB, and user-written programs on the Internet (materials available via Stata's `net` command) by entering your search term(s) in the search box, clicking on the magnifying glass, and selecting *Search net resources*.
9. If you select *Search documentation and FAQs*, Stata searches Stata's keyword database. If you select *Search net resources*, Stata searches for *Stata Journal*, STB, and user-written programs available for free download on the Internet; see [GSW] 19 [Updating and extending Stata—Internet functionality](#) for more information.
10. You can also select *Search all*, which is equivalent to choosing both *Search documentation and FAQs* and *Search net resources*. This is the equivalent of Stata's `findit` command.

Let's illustrate the **Help** system with an example. You will get the most from the example if you work along at your computer.

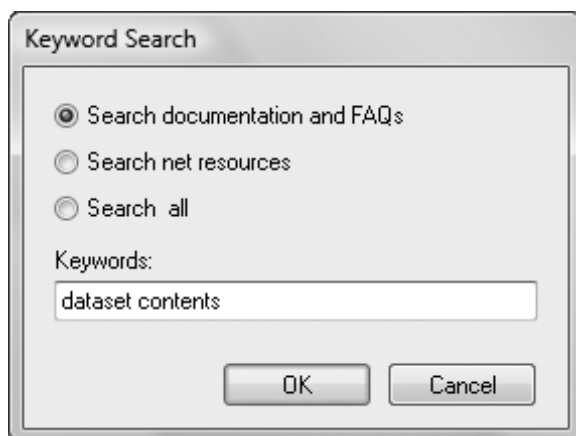
Suppose that we have been given a dataset about antique cars, and we need to know what it contains. Though we still have a vague notion of having seen something like this while working through the example session in [GSW] 1 [Introducing Stata—sample session](#), we do not remember the proper command.

Start by typing `sysuse auto, clear` in the Command window to bring the dataset into memory. (See [GSW] 5 [Opening and saving Stata datasets](#) for information on the `clear` option.)

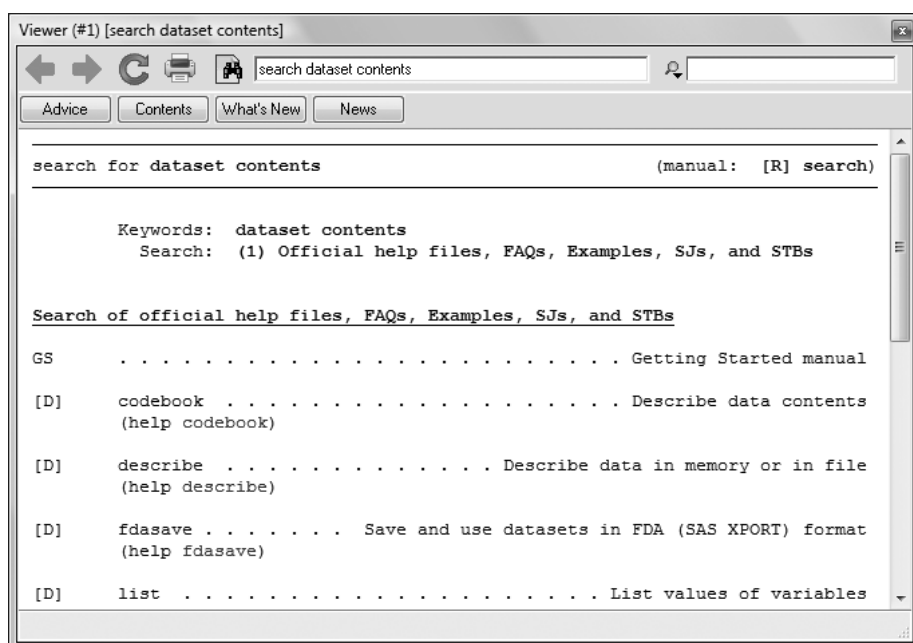
Following the above approach, we

1. Select **Help > Search...**
2. Check that the *Search documentation and FAQs* radio button is selected.

3. Enter dataset contents into the search box, and click on **OK** or press *Enter*. Before pressing *Enter*, the window should look like

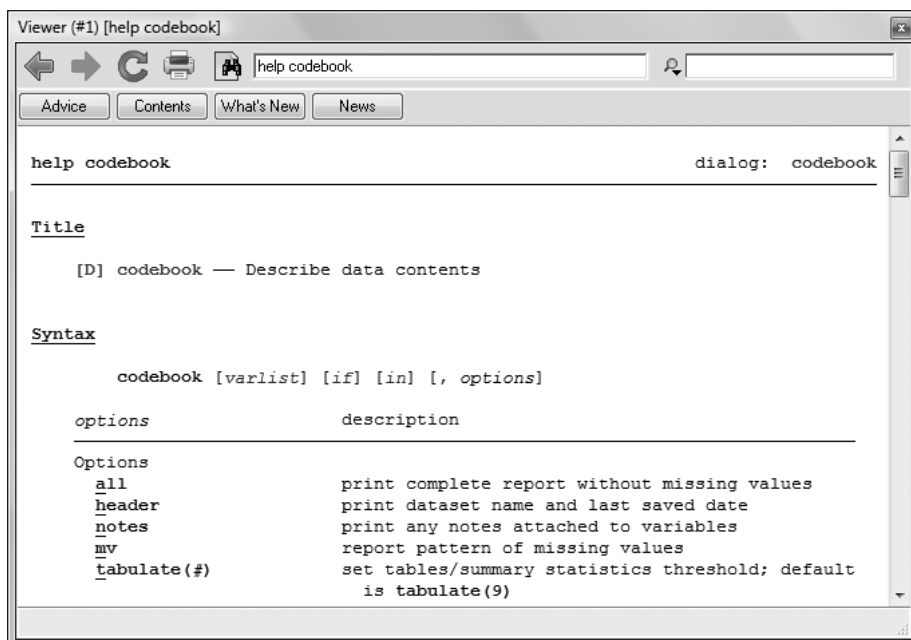


4. Stata will now search for “dataset contents” among the Stata commands, the reference manuals, the *User’s Guide*, the *Stata Journal*, the *Stata Technical Bulletin*, and the FAQs on Stata’s web site. Here is the result:



5. Upon seeing the results of the search, we see two commands that look promising: `codebook` and `describe`. Because we are interested in the contents of the dataset, we decide to check out the `codebook` command. The [D] means that we could look up the `codebook` command in the *Data-Management Reference Manual*. The blue `codebook` link in (help `codebook`) means that there is an online help file for the `codebook` command. This is what we are interested in right now.

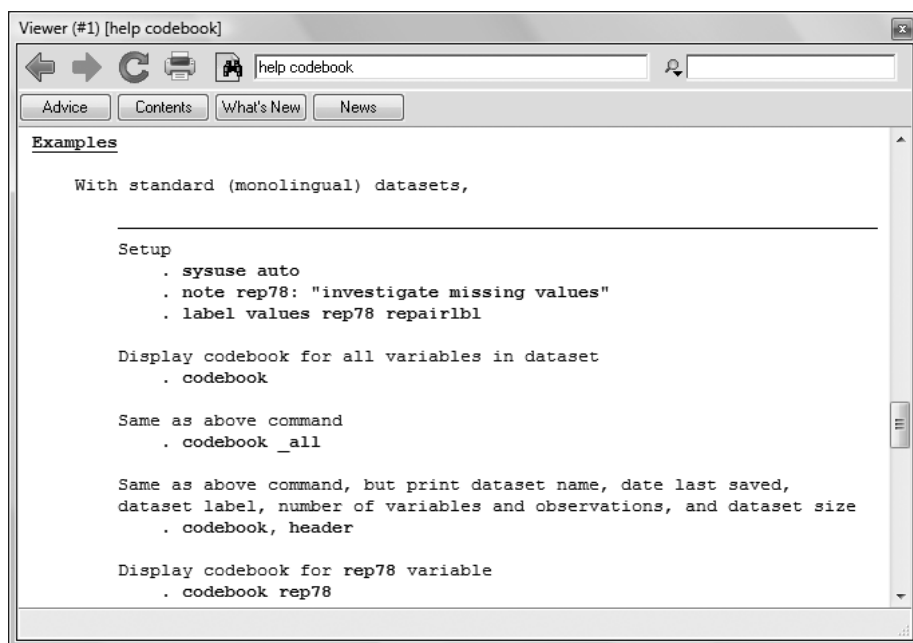
6. Click on the blue [codebook](#) link. Links can go to a variety of resources, such as help for Stata commands, dialog boxes, and even web pages. Here the link goes to the help file for the `codebook` command.



7. What is displayed is typical for help for a Stata command. Help files for Stata commands contain, from top to bottom,
- Links to dialog(s) that can be useful in issuing the command. In this example, there is one link to the `codebook` dialog.
 - A link to the manual entry for `codebook` in the PDF documentation. Clicking the link will open your PDF viewer and show you the complete documentation for `codebook`.
 - The command's syntax, i.e., rules for constructing a command that Stata will correctly interpret. The square brackets here indicate that all the arguments to `codebook` are optional but that if we wanted to specify them, we could use a *varlist*, an *if* qualifier, or an *in* qualifier, along with some options. (Options vary greatly from command to command.) The options are listed directly under the command and are explained in some detail later in the help file. You will learn more about command syntax in [\[GSW\] 10 Listing data and basic command syntax](#).
 - The location in the menu system for the `codebook` command.
 - A description of the command. Because "codebook" is the name for big binders containing hard copy describing each of the elements of a dataset, the description for the `codebook` command is justifiably terse.
 - The options that can be used with this command. These are explained in much greater detail than in the listing of the possible options after the syntax. Here, for example, we can see that the `mv` option can look to see if there is a pattern in the missing values—something important for data cleaning and imputation.
 - Examples of command usage. The `codebook` examples are real examples that step through using the command on a dataset either shipped with Stata or loadable within Stata from the Internet.

- h. The information codebook saves in the returned results. These results are used primarily by programmers.
- i. References to related commands, some of which are links to manual entries, some of which are links to help files.

For now, scroll down to the examples. It is worth going through the examples as given in the help file. Here is a screen shot of the top of the examples:



Searching help

Search is designed to help you find information about statistics, graphics, data management, and programming features in Stata. When entering topics for the search, use appropriate terms from statistics, etc. For example, you could enter Mann-Whitney. Multiple topic words are allowed, e.g., regression residuals. For advice on using **Search**, click on the **Advice** button, and follow your choice of advice links.

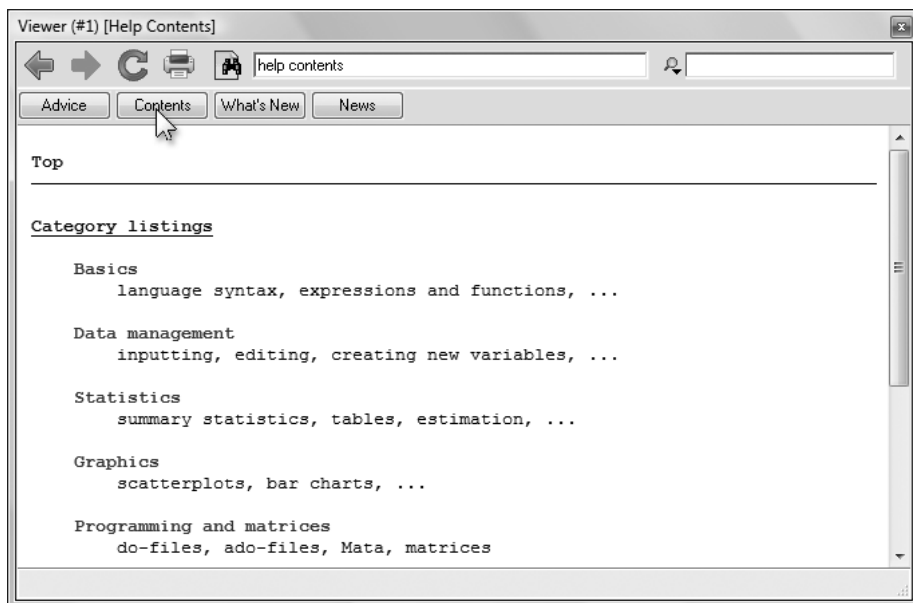
When you are using **Search**, use proper English and proper statistical terminology. If you already know the name of the Stata command and want to go directly to its help file, select **Help > Stata Command...** and type the command name. You can also type the command name in the *search* field at the top of the Viewer and press *Enter*.

Help distinguishes between topics and Stata commands, because some names of Stata commands are also general topic names. For example, *logistic* is a Stata command. If you choose **Stata Command...** and enter *logistic*, you will go right to the help file for the command. But if you choose **Search...** and enter *logistic*, you will get search results listing the many Stata commands that relate to logistic regression.

Remember that you can search for help from within a Viewer window by typing a command in the Command box of the Viewer or by selecting the scope of the search by using the button to the left of the Search box, typing the search criteria in the Search box, and pressing *Enter*.

Contents

If you click on the **Contents** button, you will see several help categories.



Click on a link to display more information about that category. For example, if you click on **Statistics**, more information about statistics will be displayed.

Help and search commands

As you may expect, the help system is accessible from the Command window. This feature is especially convenient when you need help on a particular Stata command. Here is a short listing of the various commands you can use:

- Typing `search topic` in the Command window produces the same output as selecting **Help > Search...**, choosing *Search documentation and FAQs*, and entering *topic*. The output appears in the Results window, not in a Viewer.
- Typing `search topic, net` in the Command window produces the same output as selecting **Help > Search...**, choosing *Search net resources*, and entering *topic*. The output appears in the Results window, not in a Viewer.
- Typing `search topic, all` in the Command window produces the same output as selecting **Help > Search...**, choosing *Search all*, and entering *topic*. The output appears in the Results window, not in a Viewer.
- Typing `findit topic` in the Command window behaves like `search topic, all`, except the output appears in a Viewer window. This is often the fastest way to search.
- Typing `help commandname` is equivalent to selecting **Help > Stata Command...** and entering *commandname*. The help file for the command appears in a new Viewer.
- Typing `chelp commandname` is similar to selecting **Help > Stata Command...** and entering *commandname*, except the help file for the command appears in the Results window instead of a Viewer.

See [U] 4 [Stata's help and search facilities](#) and [U] 4.9 [search: All the details](#) in the *User's Guide* for more information about these command-language versions of the **Help** system. The **search** command, in particular, has a few capabilities (such as author searches) that we have not demonstrated here.

The Stata reference manuals and User's Guide

Notations such as [R] [ci](#), [R] [regress](#), and [R] [ttest](#) in the **Search** results and help files are references to the three-volume *Base Reference Manual*. You may also see things like [P] [#delimit](#), which is a reference to the *Programming Reference Manual*, and [U] 9 [The Break key](#), which is a reference to the *User's Guide*. For a complete list of manuals and their shorthand notations, see *Cross-referencing the documentation*, which immediately follows the table of contents in this manual. Many of the links in the help files point to the PDF versions of the manuals that came with Stata. It is worth clicking on these links to read the extensive information found in the manuals. The Stata help system, though extensive, contains only a fraction of the information found in the manuals.

The Stata reference manuals are each arranged like an encyclopedia, alphabetically, and each has its own index. The *User's Guide* also has an index. The *Quick Reference and Index* contains a combined index for the *User's Guide* and all the reference manuals. This combined index is a good place to start when you are looking for information about a command.

Entries have names like **collapse**, **egen**, . . . , **summarize**, which are generally themselves Stata commands.

For advice on how to use the reference manuals, see [GSW] 18 [Learning more about Stata](#), or see [U] 1.1 [Getting Started with Stata](#).

The Stata Journal and the Stata Technical Bulletin

The *Search documentation and FAQs* facility searches all the Stata source materials, including the online help, the *User's Guide*, the reference manuals, this manual, the *Stata Journal*, the *Stata Technical Bulletin* (STB), and the FAQs on Stata's web site.

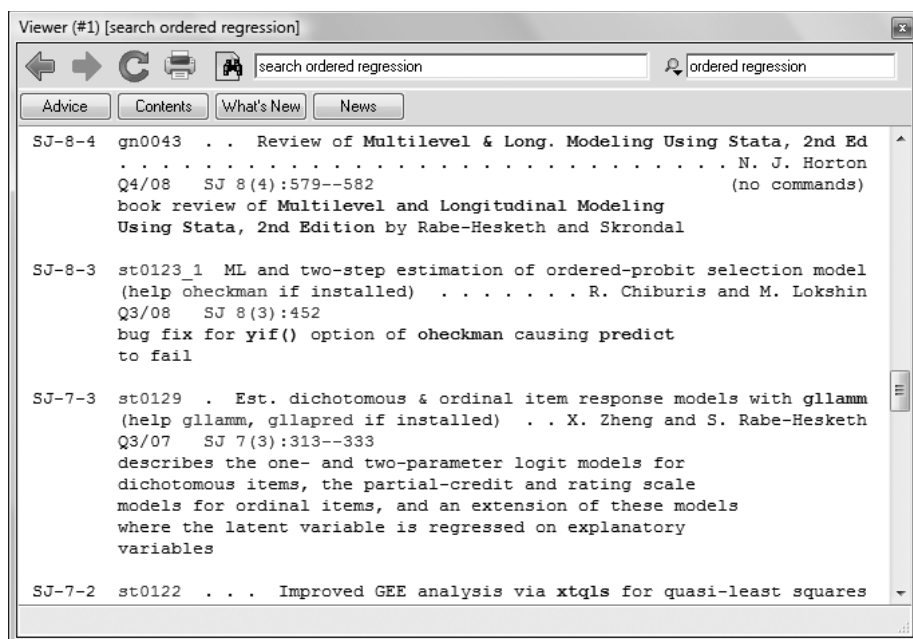
The *Search net resources* facility searches all materials available via Stata's **net** command; see [R] [net](#). These materials include the *Stata Journal*, STB, and user-written additions to Stata available on the Internet.

The *Stata Journal* is a printed and electronic journal, published quarterly, containing articles about statistics, data analysis, teaching methods, and effective use of Stata's language. The *Journal* publishes reviewed papers together with shorter notes and comments, regular columns, tips, book reviews, and other material of interest to researchers applying statistics in a variety of disciplines. The *Journal* is a publication for all Stata users, both novice and experienced, with different levels of expertise in statistics, research design, data management, graphics, reporting of results, and of Stata, in particular. See <http://www.stata-journal.com> for more information. There, you may browse the archive, subscribe, order PDF copies of individual articles, and view at no charge copies of articles older than 3 years.

The predecessor to the *Stata Journal* was the *Stata Technical Bulletin* (STB). Even though the STB is no longer published, past issues contain articles and programs that may interest you. See <http://www.stata.com/bookstore/stbj.html> for the table of contents of past issues, and see the STB FAQs at <http://www.stata.com/support/faqs/res/stb.html> for detailed information on the STB.

Associated with each issue of both the *Stata Journal* and the STB are the programs and datasets described therein. These programs and datasets are made available for download and installation over the Internet, not only to subscribers, but to all Stata users. See [R] [net](#) and [R] [sj](#) for more information.

Because the *Stata Journal* and the STB have had several articles dealing with regression models, if you select **Help > Search...** and choose *Search documentation and FAQs*, and enter ordered regression, you will see some of these references:



SJ-8-4 refers to volume 8, number 4 of the *Stata Journal*. This is an example of a review article.

SJ-8-3 refers to volume 8, number 3 of the *Stata Journal*. This is an example of a *Stata Journal* article that updates the `oheckman` user-written command. The command can be downloaded and installed to extend the abilities of Stata. See [Downloading user-written programs](#) in [\[GSW\] 19 Updating and extending Stata—Internet functionality](#) for more information.

Clicking the SJ links will open a browser and take you to the Stata Press web site, where you can download abstracts and articles. The Stata Press web site allows all articles that are older than three years old to be downloaded for free.

Links to other sites where you can freely download programs and datasets for Stata can be found on the Stata web site; see <http://www.stata.com/links/>. See [Downloading user-written programs](#) in [\[GSW\] 19 Updating and extending Stata—Internet functionality](#) for more details on how to install this software. Also see [\[R\] ssc](#) for information on a convenient interface to resources available from the Statistical Software Components (SSC) archive.

We recommend that all users subscribe to the *Stata Journal*. See [\[U\] 3.5 The Stata Journal](#) for more information.

Notes

5 Opening and saving Stata datasets

How to load your dataset from disk and save it to disk

Opening and saving datasets in Stata works similarly to those tasks in other computer applications. There are a few differences, however. First off, it is possible to save and open files from within Stata's Command window. Second, Stata allows just one dataset to be open and in use at any one time. It is possible to have many Viewers viewing many files, but only one dataset may be in use at any time. Keeping this in mind will make Stata's care in opening new datasets clear. This chapter outlines all the possible ways to open and save datasets.

A Stata dataset can be opened in a variety of ways, most of which are probably familiar to you from other applications:

- Double-click on a Stata data file, which is a file whose extension is *dta*. Note: The file extension may not be visible, depending on what options you have set in your operating system.
- Select **File > Open...** or click on the **Open** button and navigate to the file.
- Select **File > Recent Datasets > filename**.
- Type `use filename` in the Command window. Stata will look for *filename* in the current working directory. If the file is located elsewhere, you will need to give its path.

Because Stata has at most one dataset open at a time, opening a dataset will cause Stata to discard the dataset that is currently in memory. If there have been changes to the data in the currently open dataset, Stata will refuse to discard the dataset unless you force it to do so. If you open the file with any method other than the Command window, you will be prompted. If you use the Command window and the current data have changed, you will get the following error:

```
. sysuse auto
no; data in memory would be lost
r(4);
```

These behaviors protect you from mistakenly losing data.

To save an unnamed dataset (or an old dataset under a new name):

1. Select **File > Save As...**
2. Type `save filename` in the Command window.

To save a dataset for use with Stata 8 or Stata 9:

1. Select **File > Save As...**, and select **Stata 9 Data (*.dta)** from the **Save as type** list.
2. Type `saveold filename` in the Command window.

To save a dataset that has been changed (overwriting the original data file):

1. Select **File > Save**.
2. Click on the **Save** button.
3. Simply type `save, replace` in the Command window.

Once you overwrite a dataset, there is no way to recover your original dataset. With important datasets, you may want to either keep a backup copy of your original *filename.dta* or save your changes to a dataset under a new name. This is no different from working with a word-processing document, except that recovering from an inadvertent save with a dataset is nearly impossible.

Important note: Changes you have made to a dataset are not permanent until you save them. You work with a copy of the dataset in memory, not with the data file itself. This should not be surprising, because it is the way that you work with most all applications on your computer.

If you do not want to save your dataset, you can clear the dataset in memory and open a new dataset by typing `use filename, clear`.

Troubleshooting

If you try to open a dataset and Stata complains that there is not enough memory, your dataset is larger than the amount of memory that Stata is using. This can happen because Stata must load the entire dataset into memory before it can be used. (By default, Stata/MP and Stata/SE use 50 MB of memory for data, and Stata/IC uses 10 MB of memory.) Changing the amount of memory Stata uses can be done easily from within Stata. The memory for Small Stata cannot be changed. For full details, see [GSW] **B Managing memory**.

6 Using the Data Editor

The Data Editor

The Data Editor gives a spreadsheet-like view on data, if any, that are currently in memory. You can use it to enter new data, edit existing data, and edit attributes of the data in the dataset, such as variable names, labels, and display formats, as well as value labels.

Any action you take in the Data Editor results in a command being issued to Stata as though you had typed it into the Command window. This means that you can keep good records and learn commands by using the Data Editor.

The Data Editor can be kept open while you work in Stata, giving you a live view of your dataset as you work. To protect your data from inadvertent changes, the Data Editor has two modes: edit mode for active editing and browse mode for viewing. In browse mode, editing within the Data Editor window is disabled. We highly recommend that you use the Data Editor in browse mode by default and switch to edit mode only when you want to make changes.

We will be entering and editing data in this chapter, so start the Data Editor in edit mode by clicking the **Data Editor (Edit)** button, .

Buttons on the Data Editor

The toolbar for the Data Editor has some standard buttons and some buttons we have not yet seen:



 **Open:** Open a Stata dataset. Stata will warn you if your current dataset has unsaved changes.

 **Save:** Save the dataset visible in the Data Editor.

 **Copy:** Copies the current selection to the Clipboard.

 **Paste:** Paste the contents of the Clipboard. You may paste only if one cell is selected—this cell will become the upper left corner of the pasted contents. Warning: This will paste over existing data.

 **Data Editor (Edit):** Changes the Editor to edit mode.

 **Data Editor (Browse):** Changes the Editor to browse mode for safely looking at data.

 **Variables Manager:** Opens the Variables Manager. See [\[GSW\] 7 Using the Variables Manager](#) for more information.

 **Variable Properties:** Opens a dialog for editing the properties of the highlighted variable.

 **Filter Observations:** Filters the observations visible in the Data Editor. Useful for looking at a subset of the current dataset.



Hide/Show Variables: Opens the *Hide/Show Variables* window. Allows viewing a subset of the variables.



Snapshots: Opens the *Snapshots* window. See [Working with snapshots](#) below.

You can move about in the Editor with typical methods:

- To move to the right, use the *Tab* key or the right arrow key.
- To move to the left, use *Shift+Tab* or the left arrow key.
- To move down, use *Enter* or the down arrow key.
- To move up, use *Shift+Enter* or the up arrow key.

You can also click within a cell to select it.

Right-clicking within the Data Editor brings up a contextual menu that allows you to manipulate the data as well as what you are viewing. We will cover much of this below. Right-clicking on the Data Editor window displays a menu from which you can do many common tasks:

- **Copy** to copy data to the Clipboard.
- **Paste** to paste data from the Clipboard.
- **Select All** to select all the data displayed in the Data Editor. This could be different from the data in the dataset if the data are filtered or some variables are hidden.
- **Variable Properties...** to display the *Variable Properties* window for the selected variable(s).
- **Replace Contents of Variable...** to bring up a dialog for replacing the values of the selected variable.
- **Sort...** to sort the dataset by the selected variable.
- **Hide Selected Variables** to hide the selected variable(s).
- **Show Only Selected Variables** to hide all but the selected variable(s).
- **Show Entire Dataset** to turn off all filters and unhide all variables.
- **Keep Only Selected Data** to keep only the selected data in the dataset. All remaining data will be dropped (removed) from the dataset. As always, this affects only the data in memory. It will not affect any data on disk.
- **Drop Selected Data** to drop the selected data. This is only possible if the selected data consist of either specific variables or specific observations.
- **Value Labels** to access a submenu for managing and displaying value labels.
- **Preferences...** to set the preferences for the Data Editor.
- **Font...** to change the font of the Data Editor.

Data entry

Entering data into the Data Editor is similar to entering data into a spreadsheet. One difference is that the Data Editor has the concept of observations, which makes the data entry smart. We will illustrate this with an example. It will be useful for you to follow the example at your computer. You will need to start with an empty dataset to work along, so save your dataset if necessary, and then type `clear` in the Command window.

Note: As a check to see if your data have changed, type `describe, short` (or `d,s` for short). Stata will tell you if your data have changed.

Suppose that we have the following dataset:

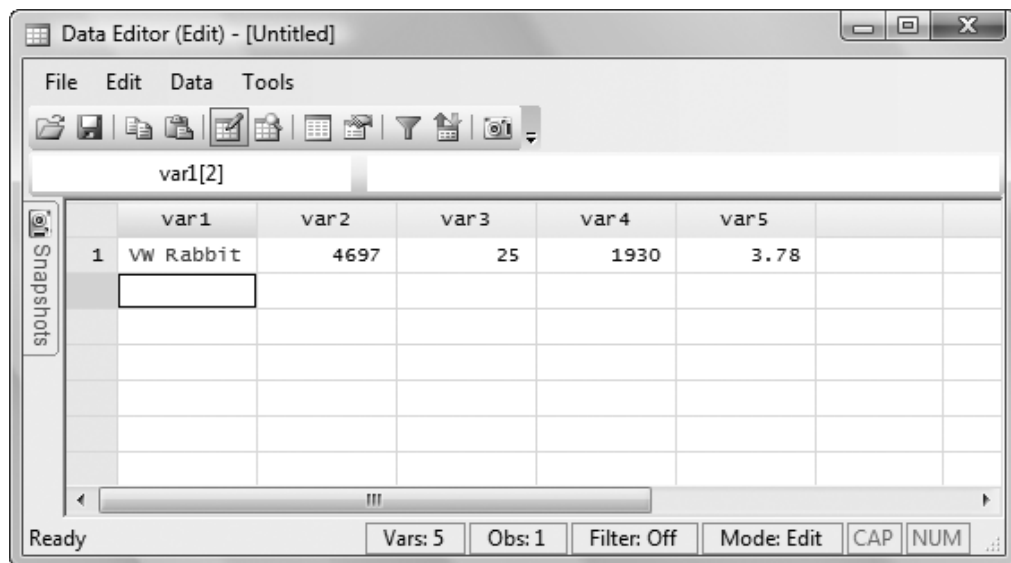
Make	Price	MPG	Weight	Gear Ratio
VW Rabbit	4697	25	1930	3.78
Olds 98	8814	21	4060	2.41
Chev. Monza	3667		2750	2.73
AMC Concord	4099	22	2930	3.58
Datsun 510	5079	24	2280	3.54
	5189	20	3280	2.93
Datsun 810	8129	21	2750	3.55

We do not know MPG for the third car or the make of the sixth.

Start by opening the Data Editor in edit mode. You can do this either by clicking on the **Data Editor (Edit)** button, , or by typing `edit` in the Command window. You should be greeted by a Data Editor with no data displayed. (If you see data, type `clear` in the Command window.) Stata shows the active cell by highlighting it and displaying `varname[obsnum]` next to the input box in the *Cursor Location* box. We will see below that we can navigate within a dataset by using this cell reference. The Data Editor starts, by default, in the first row of the first column. Because there are no data, there are no variable names, and so Stata shows `var1[1]` as the active cell.

We can enter these data either by working across the rows (observation by observation) or by working down the columns (variable by variable). To enter the data observation by observation, press *Tab* after entering each value until you have reached the end of the first row. In our case, we would type `VW Rabbit`, press *Tab*, type `4697`, press *Tab*, and continue entering data to complete the first observation.

After you are finished with the first observation, select the second cell in the first column either by clicking within it or by navigating to it. At this point, your screen should look like this:



We can now enter the data for the second observation in the same fashion as the first—with one nice difference: after entering the last value in the row, pressing the *Tab* key will bring us to the first cell in the third row. This is possible because the number of variables is known after the first observation has been entered, so Stata knows when it has all the data for an observation.

We can enter the rest of the data by pressing the *Tab* key between entries, simply skipping over missing values by tabbing through them.

If we had wanted to enter the data variable by variable, we could have done that by pressing *Enter* between each make of car until all 7 observations were entered, skipping past the missing entry by using *Enter* twice in succession. Once the first variable was entered we would select the first cell in the second column and enter the price data. We would continue this until we were done.

Notes on data entry

There are several things to note about data entry and the feedback you get from the Data Editor as you enter data:

- *Stata does not allow blank columns or rows in the middle of your dataset.*
Whenever you enter new variables or observations, always begin in the first empty column or row. If you skip columns or rows, Stata will fill in the intervening columns or rows with missing values.
- *Strings and value labels are color coded.*
To help distinguish between the different types of variables in the Data Editor, string values are displayed in red, value labels (see [GSW] 9 Labeling data) are displayed in blue, and all other values are displayed in black. You can change the colors for strings and value labels by right-clicking on the Data Editor window and selecting **Preferences...**
- *A period (‘.’) represents Stata’s system missing numeric value.*
Stata has a system missing value, ‘.’, and extended missing values ‘.a’ through ‘.z’. By default, Stata uses its system missing value.
- *The Tab key is smart.*
As we saw above, after the first observation has been entered, Stata knows how many variables you have. So at the end of the second observation (and all subsequent observations), *Tab* will automatically take you back to the first column.
- *The Cursor Location box both shows location and is used for navigation.*
The Cursor Location box gives the location of the current cell. If you see, for example, `var3[4]`, this means that the current cell is the fourth observation of the variable named `var3`. You can navigate to a particular cell by typing the variable name and the observation in the Cursor Location box. If you wanted the second observation of `var1` to be the active cell, typing `var1 2` in the Cursor Location box and pressing *Enter* would take you there.
- *Quotes around text are unnecessary in string variables.*
Once Stata knows that a variable is a string variable (it holds text), there is no need to put quotes around the values, even if the values look like a number. Thus, if you wanted to enter ZIP codes as text, you would enter the first ZIP code with quotes ("02173"), but the rest would not need any quotes.
- If you select a cell and type new data, using an arrow key will accept the change and move to a new active cell. If you double-click on a cell, you can edit within the cell contents. In this case, the arrow keys move within the cell’s data.
- If, while you are entering data in a cell, you decide you would like to cancel the changes, press the *Esc* key or click outside the cell.

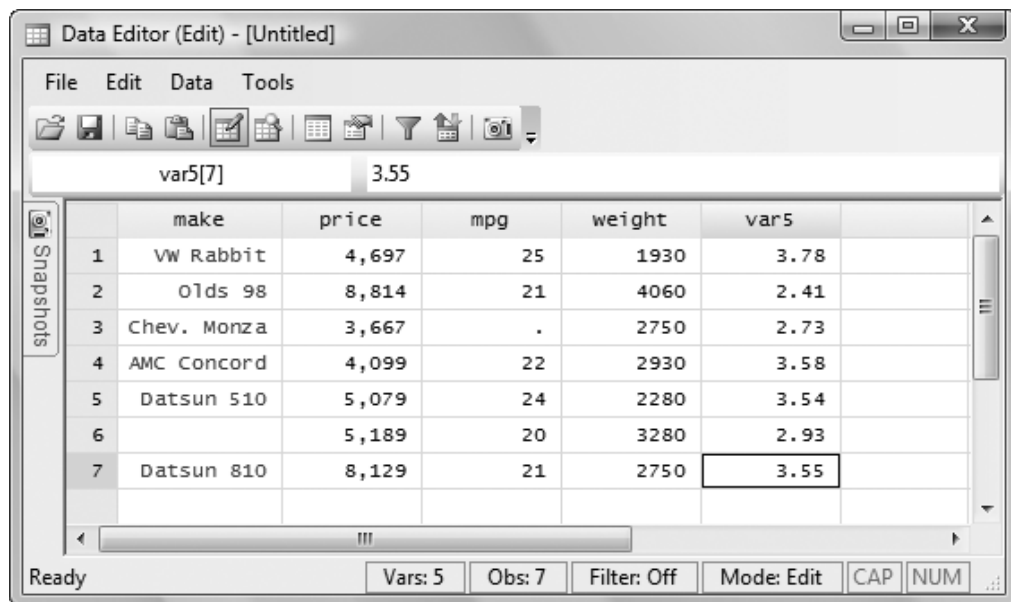
Renaming and formatting variables

The data have now been entered into Stata, but the variable names leave something to be desired: they have the default names `var1`, `var2`, ..., `var5`. We would like to rename the variables so that they match the column titles from our dataset. We would also like to give the variables descriptions and change their formatting.

We will step through changing the name, format, and label of the price variable. Start by right-clicking somewhere within the column for price and select **Variable Properties...** from the contextual menu. This opens the *Variable Properties* window where we can change the name, variable label, display format, and value label. Once the dialog box is open,

1. Double-click within the *Name* field to select the old variable name, `var2`, and type price to overwrite the name.
2. Press *Tab* to change focus to the *Label* field.
3. Enter a worthwhile label, such as *Price in Dollars*.
4. Click the ... button next to the *Format* field. You can see here that there are many possible formats, most of which are related to time. We want commas in our numbers, so check the *Use commas in numeric output* checkbox. When you are done, click the **OK** button.
5. These are all the changes for *price*, so click the **Apply** button to make the changes stick.

To edit the properties of another variable, either click within that variable's column or use the navigation arrows in the *Variable Properties* window until the variable's name appears. We can name the first variable *make*, the third *mpg*, the fourth *weight*, and the fifth *gear_ratio*. Just before renaming `var5` to *gear_ratio*, your screen should look like this:



You need to know some rules for variable names:

- *Stata is case sensitive.*
Make, make, and MAKE are all different names to Stata. If you had named your variables *Make*, *Price*, *MPG*, etc., then you would have to type them correctly capitalized in the future. Using all lowercase letters is easier.
- *A variable name must be 1–32 characters long.*

- The characters can be letters (A–Z, a–z), digits (0–9), or underscores (_).
 - Spaces or other characters are not allowed.
 - The first character of a variable name must be a letter or an underscore.
- Although you can use an underscore to begin a variable name, it is highly discouraged. Such names are used for temporary variable names in Stata. You would like your data to be permanent, so using a temporary name could lead to great frustration.

For more information about variable and value labels, see [GSW] 9 Labeling data; for display formats, see [U] 12.5 Formats: Controlling how data are displayed.

Copying and pasting data

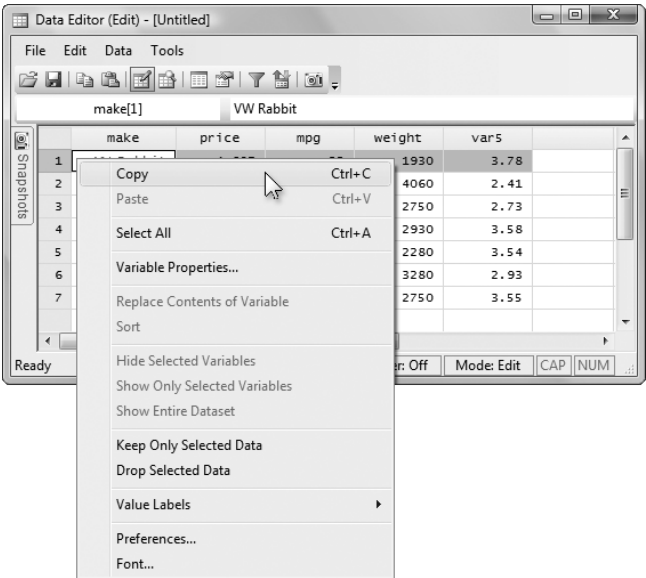
You can copy and paste data by using the Data Editor. This is often a simple way to bring data into Stata from any other applications such as spreadsheets or databases.

1. *Select the data that you wish to copy.*
 - a. Click once on a variable name or column heading to select an entire column.
 - b. Click once on an observation number or row heading to select the entire row.
 - c. Click and drag the mouse to select a range of cells.
2. *Copy the data to the Clipboard.*

Right-click within the selected range, and select **Copy**.
3. *Paste the data from the Clipboard.*
 - a. Click on the top left cell of the area to which you wish to paste.
 - b. Right-click on the same cell, and select **Paste**.

We will illustrate copying and pasting an observation by making a copy of the first observation and pasting it at the end of the dataset.

Start by clicking on the observation number of the first observation. Doing so highlights all the data in the row. Right-click on the same location (there is no need to move the mouse), and select **Copy**:



Click on the first cell in the eighth row, right-click while you are still in that cell, and choose **Paste** from the resulting menu. You can see that the observation was successfully duplicated.

Notes on copying and pasting

- The above example illustrated copying and pasting within the Data Editor. You can use roughly the same technique to copy and paste between other applications and Stata, and between Stata and other applications. The one requirement for things to work well is that the external application must copy tables in either tab-delimited or comma-delimited form, as do spreadsheet applications, many database applications, and some word processors. The easiest way to see if copying and pasting works properly is to try it. For more information on file-based methods for importing data into Stata, see [GSW] 8 **Importing data**.
- If you are copying and pasting data with value labels, you have a choice. You can copy variables with value labels as text, using the value labels as the actual values, or you can copy said variables as their underlying encoded numbers. Copying with the value labels is the default. If you would like the other choice, select **Tools > Value Labels > Hide All Value Labels**.

Changing data

As its name suggests, the Data Editor can be used to edit your dataset. As we have seen already, it can be used to edit the data themselves as well as the description and display options for the variables.

Here is an example for making some changes to the `auto` dataset, which illustrates both methods for using the Data Editor and its documentation trail. We will also keep *snapshots* of the dataset as we are working, so that we can revert to previous versions of the dataset in case we make a mistake.

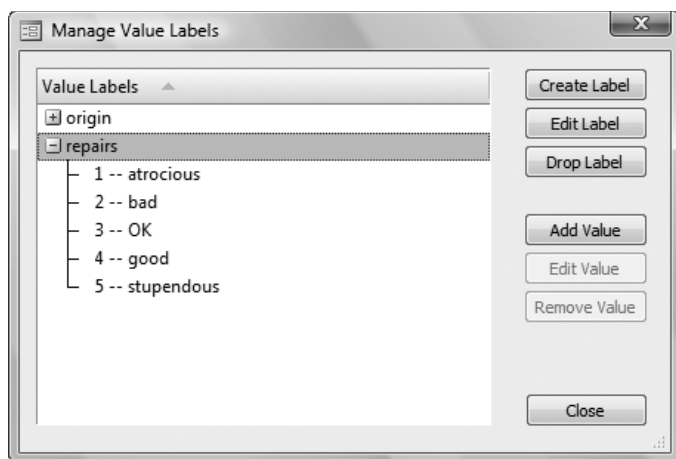
We would like to investigate the dataset, work with value labels, delete the `trunk` variable, and make a new variable showing gas consumption per 100 miles. These tasks will illustrate the basics of working in the Data Editor.

Start by typing `sysuse auto` into the Command window. You get an error and are told that your data have changed. This is good—Stata is keeping you from inadvertently destroying your data. If you would like to save the dataset, select **File > Save** and save the dataset in an appropriate location. Otherwise, type `clear` in the Command window and press *Enter* to clear out the data.

Once the `auto` dataset is loaded, start the Data Editor.

1. We would like to see which cars have the lowest and highest gas mileages. To do this, right-click within the `mpg` column. Select **Sort...** from the contextual menu. A dialog will pop up asking if you want to sort. Click on **OK**. (Stata worries about sort order, because sort order can affect reproducibility when using resampling techniques. This is a good thing.) You will see that the data have now been sorted by `mpg` in ascending order. The lowest-mileage cars are at the top of the screen; by scrolling to the bottom of the dataset, you can find the highest-mileage cars. You also could have sorted by selecting **Tools > Sort...** once the `mpg` variable was selected. For more general sorting, you could use **Data > Sort**, and pick what you need.
2. We would like to investigate repair records, and hence sort by the `rep78` variable. (Do this now.) We see that the Starfire and Firebird both had poor repair records, but we would like to see the cars with good repair records. We could scroll to the bottom of the dataset, but it will be faster to use the *Cursor Location* box: type `rep78 74` and press *Enter* to make `rep78[74]` the active cell. We notice that the last 5 entries for `rep78` are missing. A few items of note:
 - a. As we can see from the result of the sort, Stata views missing values as being larger than all numeric nonmissing values: `rep78 >= .` is equivalent to `missing(rep78)`.

- b. What we do not see here is that Stata has multiple missing-value indicators: ‘.’ is Stata’s default or system missing-value indicator, and .a, .b, ..., .z are Stata’s extended missing values. Extended missing values are useful for indicating the reason why a value is unknown.
 - c. The different missing values sort within themselves: . < .a < .b < ... < .z. See [U] 12.2.1 Missing values for full details.
3. We would like to make the repair records readable. To start this procedure, right-click within any cell—preferably on a cell in the `rep78` column (though this is not necessary). From the contextual menu, choose **Value Labels > Manage Value Labels....** We need to define a new value label for the repair records.
 - a. Click the **Create Label** button. You will see the *Create Label* dialog.
 - b. Type a name for the label, say, `repairs`, in the *Label name* box.
 - c. Press the *Tab* key or click within the *Value* field.
 - d. Type 1 for the value, press the *Tab* key, and enter `atrocious` for the label.
 - e. Press the *Enter* key to create the pairing.
 - f. Repeat steps d and e to make all the pairings: 2 with “bad”, 3 with “OK”, 4 with “good”, and 5 with “stupendous”.
 - g. Click the **OK** button to finish creating the value.
 - h. Click the expose button, , to show the label—you should see this:



If you have something else, you can edit the label by clicking the **Edit Label** button.

- i. Click on the **Close** button to close the *Manage Value Labels* dialog.
4. Now that the label has been created, attach it to the `rep78` variable by right-clicking within any cell in the `rep78` column and selecting the **Value Labels > Assign Value Label to Variable 'rep78' > repairs** menu item. You can see that the labels now display in place of the values.
5. Suppose that we found the original source of the data in a time capsule, so we could replace some of the missing values for `rep78`. We could type the values into cells. We can also assign the values by right-clicking within a cell with a missing value and choosing a value from **Value Labels > Select Value from Value Label 'repairs'**. This can be useful when a value label has many possible values.
6. We would now like to delete the `trunk` variable. We can do this by right-clicking on the `trunk` variable and selecting the **Drop Selected Data** menu item. Because this can lead to data loss, the Data Editor asks whether we would like to drop the selected variable. Click on the **Yes** button.

7. To finish up, we would like to create a variable containing the gallons of gasoline per 100 miles driven for each of the cars.
 - a. Click on the **Tools > Add Variable at End of Dataset...** menu item to bring up the *generate* dialog box.
 - b. Type `gp100m` in the *Variable name* box.
 - c. Being sure that the *Specify a value or an expression* radio button is selected, type `100/mpg` in the formula box. We could have clicked the **Create...** button to open the *Expression builder* dialog box, but this formula was simple enough to type.
 - d. Click on **OK**. You can scroll to the right to see the newly created variable.

Throughout this data editing, session we have been using the Data Editor to manipulate the data. If you look in the Results window, you will see the commands and their output. You can also see all the commands generated by the Data Editor in the Review window. If you wanted to save the editing commands to use again later, you could do the following:

1. Click on the last command that came from the Data Editor.
2. Scroll up until you find the `edit` command that originally opened the Data Editor.
3. While holding the *Shift* key down, click on the command following `edit`.
4. Right-click on one of the highlighted commands.
5. Select **Send to Do-file Editor**.

This will save all the commands you issued into the Do-file Editor. You could then save them as a do-file which you could run again later. We will talk more about the Do-file Editor in [\[GSW\] 13 Using the Do-file Editor—automating Stata](#). You can find help about do-files in [\[U\] 16 Do-files](#).

If you want to save this dataset, save it under a new name by using **File > Save As...** so as not to overwrite the original dataset.

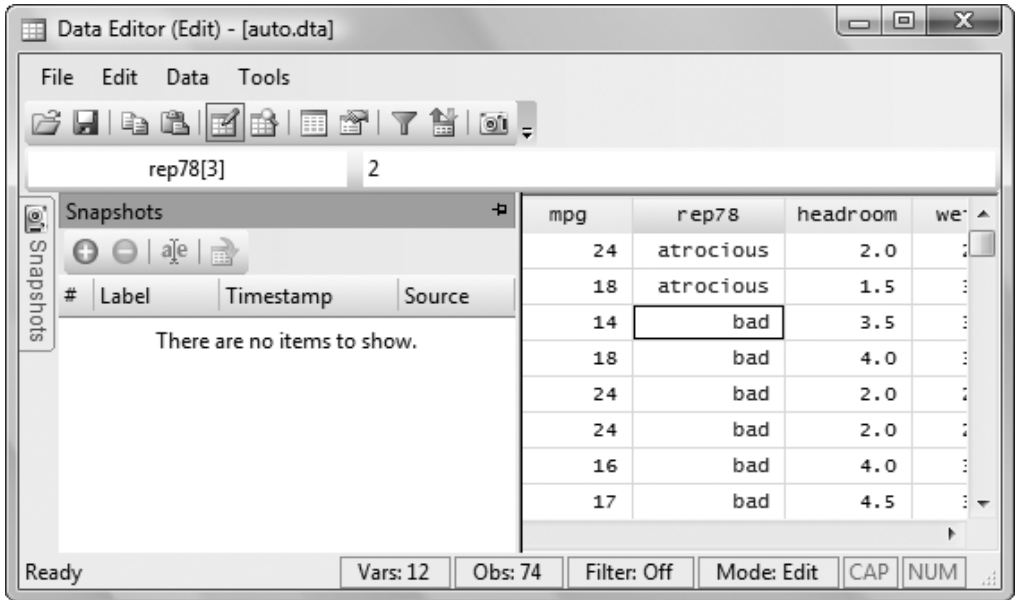
Working with snapshots

The Data Editor allows you to save to disk *snapshots* of whatever dataset you are working on. These are temporary copies of the dataset—they will be deleted when you exit Stata, so they need to be treated as temporary. Still, there are many uses for snapshots, such as

- Saving a temporary copy of the data in memory so that another dataset can be opened and viewed.
- Saving stages of work, which can be recovered in case of doing something disastrous.
- Saving pieces of datasets while doing analyses.

We will keep using the `auto` dataset from above; if you are starting here, you can start fresh by typing `sysuse auto` in the Command window to open the dataset. (If you get a warning about data in memory being lost, either use `clear` or save your data. See [\[GSW\] 5 Opening and saving Stata datasets](#) for more information.) If we open the Data Editor and click on the **Snapshots** tab, we see the following. If you are starting fresh, you will see numbers rather than labels for `rep78`.

(Continued on next page)



To begin with, only one button is active. Click the active button—the **Add** button, . It brings up a dialog asking for a label, or name, for the snapshot. Give it an inventive name, such as **Start**. You can see that a snapshot is now listed in the Snapshots window, and all the buttons are highlighted.



Add: Save a new snapshot with a timestamp and label.



Remove: Erase a snapshot. This deletes the temporary snapshot file, but does not affect the data in memory.



Change Label: Edit the label of the selected (highlighted) snapshot.



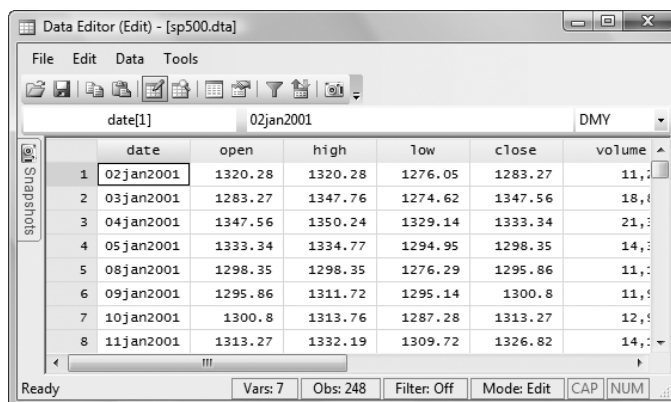
Restore: Replace the data in memory with the data from the selected snapshot. If the data in memory have changed, you will get a dialog box confirming your action.

You should now try manipulating the dataset using the tools we have seen. Once you have done this, create another snapshot, calling it **Changed**. Open the *Snapshots* window and restore the **Start** snapshot by clicking first on it and then on the **Restore** button to see where you started. You can then go back to where you were working by restoring your **Changed** snapshot.

Snapshots continue to be available until either they are deleted or you exit Stata. You can thus use snapshots of one dataset while working on another. You will find your own uses for snapshots—just take care to save datasets you want for future use.

Dates and the Data Editor

The Data Editor has two special tools for working with dates in Stata. To see these in action, we will need to open another dataset. Either save your dataset or **clear** it out, and then type **sysuse sp500** in the Command window. Look in the Data Editor to see what you have.



You can see that there is a `date` variable that has January 2, 2001, as its first day, but it is in Stata's default format for dates. You should also notice in the upper right corner, the *date mask* field, which shows DMY. This affects how dates are entered when editing data.

We will start with formatting:

1. Right-click within a cell in the `date` column, and select **Variable Properties....**
2. In the *Variable Properties* window, click the button to the right of the *Format* field.
3. The *Create format* dialog tells us three pieces of information about the date format:
 - a. These are daily dates. As you can see, Stata understands other types of dates that are often used in financial data.
 - b. Looking at the bottom of the dialog, you can see that the Stata default date format is `%td`. This stands for "time-daily".
 - c. This default format is displayed as, for example, 30apr2009. (Of course, this was clear in the Data Editor.)
4. There are many pre-made date formats in the Samples pane. Click on April 30, 2009. You can see how the format would be specified at the bottom of the dialog.
5. Click on **OK** to close the *Create format* dialog.
6. Click on the **Apply** button to change the `date` format.

This is a very simple way to change date formats. For complete information on dates and date formats, see [\[D\] dates and times](#).

We will now change some of the dates to illustrate how the date mask works. By default, the date mask is set to DMY. This means dates can be entered in many different fashions, as long as the order is day, month, year. Try the following:

1. With the `date[1]` cell as the active cell, type 3jan2009 and press the *Enter* key. Stata understands the order of the mask.
2. Enter 14012009 and press *Enter*. Stata still understands the mask, even though there are no separators.
3. Click within the *date mask* field, and choose MDY from the drop-down menu.
4. Click on any observation in the `date` column.
5. Type March 13, 2001 and press *Enter*. Stata will still understand.

Working in this fashion is the fastest way to edit dates by hand. If you look in the Results window, you will see why.

We are now done with this dataset, so type `clear` and press *Enter*.

Data Editor advice

As you could see above, a small mistake in the Data Editor could cause large problems in your dataset. You really must take care in how you edit your data.

1. People who care about data integrity know that editors are dangerous—it is easy to accidentally make changes. **Never use the Data Editor in edit mode when you just want to look at your data.** Use the Data Editor in browse mode (or the `browse` command).
2. If you must edit your data, protect yourself by limiting the dataset's exposure. For example, if you need to change `rep78` only if it is missing, find a way to look at just the missing values for `rep78` and any other variables needed to make the change. This will make it impossible for you to change (damage) variables or observations other than those you view. We will explore this aspect shortly.
3. Even with these caveats, Stata's editor is safer than most because it records commands in the Results window. Use this feature to log your output and make a permanent record of the changes. Then, you can verify that the changes you made are the changes you wanted to make. See [GSW] 16 [Saving and printing results by using logs](#) for information on creating log files.

Filtering and hiding

We would now like to investigate restricting our view of the data we see in the editor. This feature is useful for the reasons mentioned above, and as we will see, it helps if we would like to browse through the data of a large dataset. In any case, we would like to focus on *some*, not *all* of the data, be it some of the variables, some of the observations, or even just some observations within some variables. We will show you how this is done by using both the interface and commands.

Open the auto dataset by typing `sysuse auto`. Once you have done that, open the Data Editor.

Suppose that we would like to edit only those observations for which `rep78` is missing. We will need to look at the make of the car so that we know which observations we are working with, but we do not need to see any other variables. We will work as though we had a very large dataset to work with.

1. Click on the **Hide/Show Variables** button, .
2. Before we get started, try experimenting with filtering variables by entering some text into the *Enter filter text here* box. If you had a dataset with many variables, this would be a good way to reduce the number of variables visible when selecting your desired variables. When you are done, delete your filter text.
3. Right-click on any variable and select **Select All** from the very short contextual menu.
4. Click on any checkbox to deselect all the variables.
5. Click on the `make` variable to select it and deselect all the other variables.
6. Click on the checkbox for `make`.
7. Click on the checkbox for `rep78`.
8. Close the *Hide/Show Variables* window.

When you bring the Data Editor to the front, you will see that the only variables visible are `make` and `rep78`. If you look in the Command window, no commands have been issued, because hiding the variables does not affect the dataset—it affects only what shows in the Data Editor.

We now have protected ourselves by using only those variables that we need. We should now reduce our view to only those observations for which `rep78` is missing. This is simple.

1. Click on the **Filter Observations** button, .
2. Enter `missing(rep78)` in the *Filter by expression* field.

3. Click on the **Apply Filter** button.

4. If you are curious, click the ... button. It opens up an *Expression builder* dialog box. This lists the wide variety of functions available in Stata. See [\[D\] functions](#).

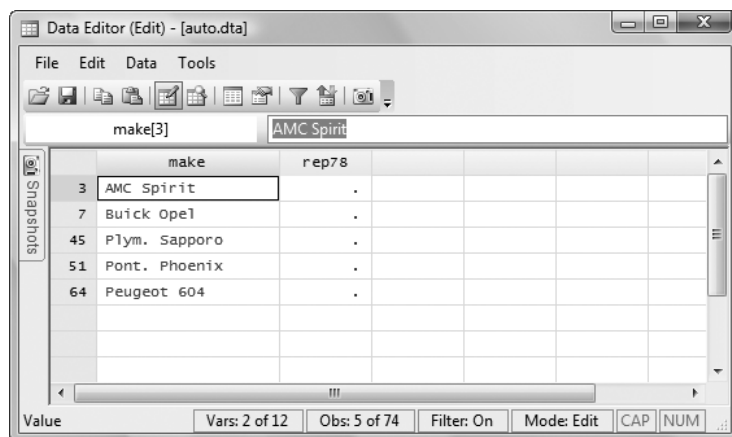
Now we are focused on the part of the dataset in which we would like to work, and we cannot destroy or mistakenly alter other data by stray keystrokes in the Data Editor window.

It is worth learning how to hide variables and filter observations in the Data Editor from the Command window. This can be quite convenient if you are going to restrict your view, as we did above. To work from the Command window, we must use the `edit` command together with a varlist (variable list) along with `if` and `in` qualifiers in the Command window. By using a varlist, we restrict the variables we look at, whereas the `if` and `in` qualifiers restrict the observations we see. ([GSW] [10 Listing data and basic command syntax](#) contains many examples of using a command with a variable list and `if` and `in`.) Suppose we want to correct the missing values for `rep78`. The minimum amount of data we need to expose are `make` and `rep78`. To see this minimal amount of information and hence to minimize our exposure to making mistakes, we enter the commands

```
. sysuse auto
(1978 Automobile Data)

. edit make rep78 if missing(rep78)
```

and we would see following screen:



Once again, we are safe and sound.

Keep this lesson in mind if you edit your data. It is a lesson well learned.

Browse mode

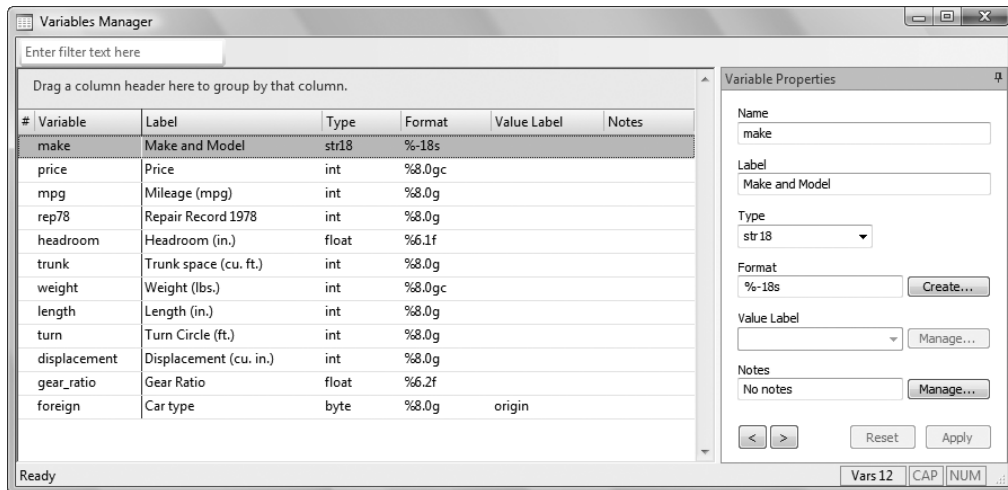
The purpose of using the Data Editor in browse mode is to be able to look at data without altering it by stray keystrokes. You can start the Data Editor in browse mode by clicking on the **Data Editor (Browse)** button, , or by typing `browse` in the Command window. When working in browse mode, all contextual menu items that would let you alter the data, the labels, or any of the display formats for the variables are disabled. You may view a variable's properties via the **Variable Properties...** menu item, but you may not make any changes. You still can filter observations and hide variables to get a restricted view, because these actions do not change the dataset.

Note: Because you can still use Stata menus not related to the Data Editor and because you can still type commands in the Commands window, it is possible to change the data even if the Data Editor is in browse mode. In fact, this means you can watch how your commands affect the dataset. You are merely restricted from using the Data Editor itself to change the data.

7 Using the Variables Manager

The Variables Manager

This chapter discusses Stata's Variables Manager.



The Variables Manager is a tool for managing properties of variables both individually and in groups. It can be used to create variable and value labels, rename variables, change display formats, and manage notes. It has the ability to filter and group variables as well as to create variable lists. Users will find these features useful for managing large datasets.

Any action you take in the Variables Manager results in a command being issued to Stata as though you had typed it in the Command window. This means that you can keep good records and learn commands by using the Variables Manager.

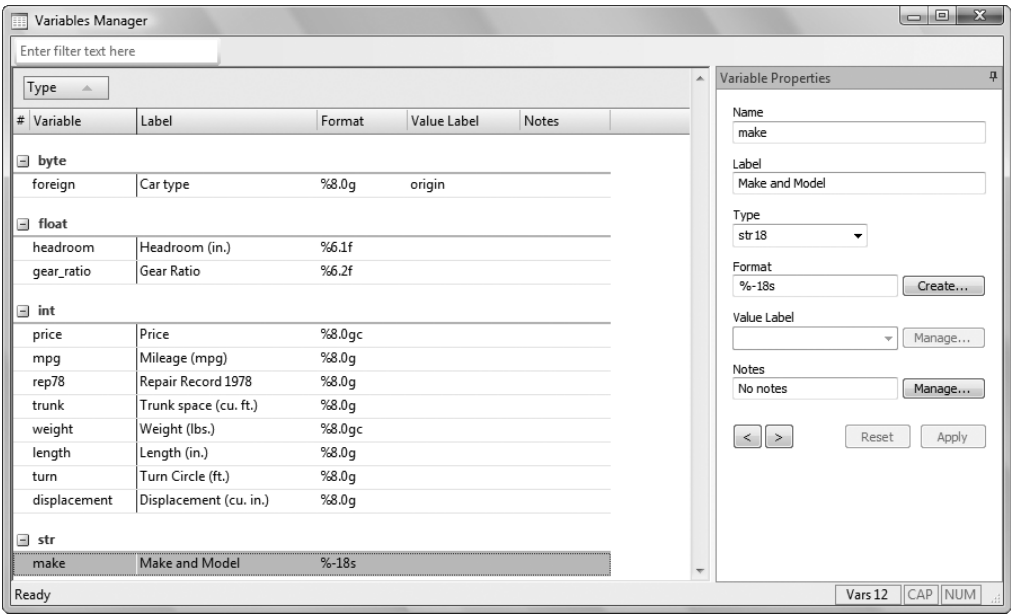
The Variable pane

The Variable pane shows the list of variables in the dataset. This list can be manipulated in a variety of ways.

- The variables can be filtered by entering text into the filter box in the upper left corner. This can be a good way to zoom in on similarly named or labeled variables.
- The list can be sorted by clicking on the columns.
 - a. If you click on a column, it will sort in ascending order.
 - b. A second click on the same column will change to sorting in descending order.
 - c. Clicking on the hash mark (#) restores the sort order to the original variable order. Alternatively, right-click on a column, and select **Show Variables in Dataset Order** to restore the sort order.

The sort order affects only the Variable Manager window—the dataset itself stays the same.

- The order of the columns can be changed by dragging the column titles. To restore the original column headings, right-click on the column titles and select **Restore Column Defaults**.
- The variables can be grouped by values in one or more columns. This is done by dragging the column(s) into the grouping bar. The grouping can be canceled by dragging the column titles back into the column titles row. Here is an example of the auto dataset grouped by variable type:



Grouping by variable label can be a good way to find unlabeled variables.

Right-clicking on the Variable pane

Right-clicking on the Variable pane displays a menu from which you can do many common tasks:

- **Edit Variable Properties** to change the focus to the Variable Properties pane. This will expose the Variable Properties pane if it has been automatically hidden.
- **Keep Selected Variables** to keep only the selected variables in the dataset, dropping all the others.
- **Drop Selected Variables** to drop all the selected variables from the dataset.
- **Manage Notes for Selected Variable...** to open a window that allows adding and deleting notes for a single variable. This is disabled if multiple variables are selected.
- **Manage Notes for Dataset...** to open a window that allows adding and deleting notes for the dataset as a whole.
- **Copy Varlist** to copy the names of the selected variables to the Clipboard.
- **Select All** to select all visible variables. If a variable has become hidden because of the filter, it will not be selected.
- **Send Varlist to Command Window** to insert the names of the selected variables in the Command window. Combined with grouping and sorting, this can be a useful way to create variable lists in large datasets.

The Variable Properties pane

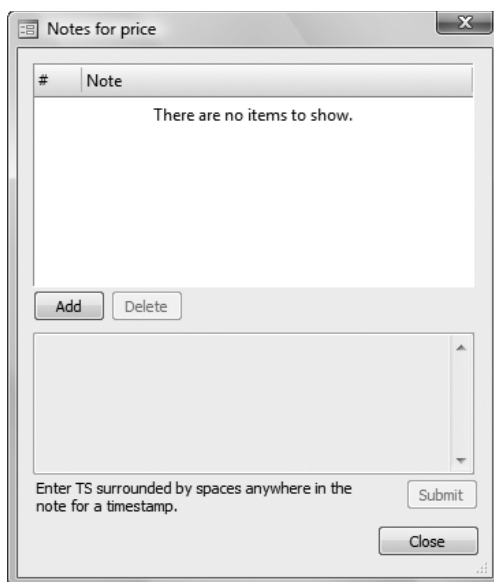
The Variable Properties pane can be used to manipulate the properties of variables selected in the Variable pane. With one variable selected, you can manipulate all properties of the variable. With many variables selected, you can change their formats or types, as well as assign value labels all at once. These fields work in the same fashion as those shown in [Renaming and formatting variables](#) in [\[GSW\] 6 Using the Data Editor](#). We can also manage the notes Stata allows you to attach to variables and the dataset—we will show an example below.

The Variable Properties pane is, in actuality, a *docking window*, like those discussed in [Auto Hide and pinning](#) in [\[GSW\] 2 The Stata user interface](#). You can see this because of the pushpin in its upper right corner. If you click on the pushpin, the window will automatically hide when not in use. You can also dock the window in another part of the Variables Manager window by dragging it by its title bar to one of the docking guides.

Managing notes

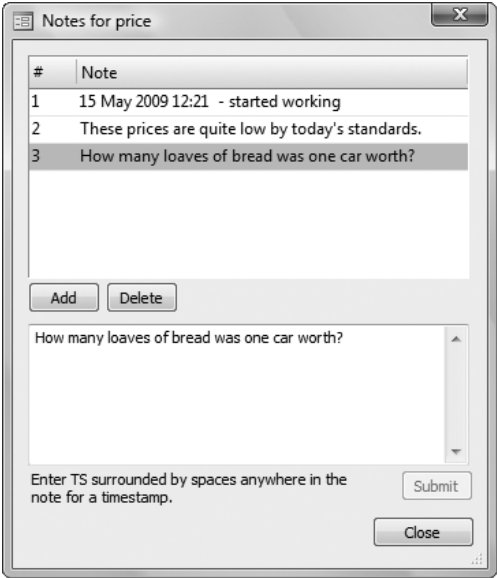
Stata allows you to attach notes to both variables and the dataset as a whole. These are simple text notes that you can use to document whatever you like—the source of the dataset, data collection quirks associated with a variable, what you need to investigate about a variable, or anything else.

Start by selecting a variable in the Variable pane. We will work with the `price` variable. Click on the **Manage...** button next to the *Notes* field, and you will see the following dialog appear:



We will add a few notes:

1. Click on the **Add** button to add a note.
2. Type `TS - started working`. `TS` with a trailing space inserts a timestamp in the note.
3. Add two more notes. We added two notes about prices:



It is worth experimenting with adding, deleting, and editing notes. These can be an invaluable memory aid when working on projects that last over a long period of time. Any time you manipulate notes in the Notes Manager, you create Stata commands.

8 Importing data

Copying and pasting

One of the easiest ways to get data into Stata is often overlooked: you can copy data from most applications that understand the concept of a *table* and then paste the data into the Data Editor. This approach works for all spreadsheet applications, many database applications, some word-processing applications, but few web browsers. Just copy the full range of data, paste it into the Data Editor, and everything will probably work well. You can even copy a text file that has the pieces of data separated by commas and then paste it into the Data Editor. There is one warning, however: be sure that your spreadsheet does not contain blank rows, blank columns, repeated headers, or merged cells because these can cause trouble. As long as your spreadsheet looks like a table, you will be fine.

If you cannot simply copy and paste a dataset, this chapter is for you. If you would like to learn methods that lend themselves better to repetitive tasks, this chapter is also for you. If your friend has interesting data in a spreadsheet application that you do not own, this chapter is for you.

Commands for importing data

This chapter explains the various commands that Stata has for importing data. The three main commands for reading plain text (ASCII) are

- `insheet`, which is made for reading text files created by spreadsheet or database programs;
- `infile`, which is made for reading simple data that are separated by spaces, or rigidly formatted data aligned in columns; and
- `infix`, which is made for data aligned in columns but possibly split across rows.

Stata has other commands that can read other types of files and can even get data from external databases without the need for an interim file:

- The `fdause` command can read any SAS XPORT file, so data can be transferred from SAS to Stata in this fashion.
- The `odbc` command can be used to pull data directly from any data sources for which you have ODBC drivers.
- The `xmluse` command can read some XML files (most notably, Microsoft Excel's SpreadsheetML).

Each command expects the file that they are reading to be in a specific format. This chapter will explain some of those formats and give some examples. For the full story, consult the *Data-Management Reference Manual*.

(Continued on next page)

The insheet command

The `insheet` command was specially developed to read in text (ASCII) files that were created by spreadsheet programs. Many people have data that they enter into their spreadsheet programs. All spreadsheet programs have an option to save the dataset as a text (ASCII) file with the columns delimited with either tab characters or commas. Some spreadsheet programs also save the column titles (variable names in Stata) in the text file.

To read in this file, you have only to type `insheet using filename`, where *filename* is the name of the text file. The `insheet` command will determine whether there are variable names in the file, what the delimiter character is (tab or comma), and what type of data is in each column. If *filename* contains spaces, put double quotes around the filename.

If you have a text (ASCII) file that you created by saving data from a spreadsheet program, then try the `insheet` command to read that data into Stata.

By default, the `insheet` command understands files that use the tab or comma as the column delimiter. If you have a file that uses spaces as the delimiter, use the `infile` command instead. See the `infile` section of this chapter for more information. If you have a file that uses another character as the delimiter, use `insheet's delimiter()` option; see [D] [insheet](#) for more information.

Suppose that your friend sent you the file `sample.csv`. It was saved from a spreadsheet application by saving the data as a *comma-separated-values* (CSV) file. It contains the following lines:

```
VW Rabbit,4697,25,1930,3.78
Olds 98,8814,21,4060,2.41
Chev. Monza,3667,,2750,2.73
,4099,22,2930,3.58
Datsun 510,5079,24,2280,3.54
Buick Regal,5189,20,3280,2.93
Datsun 810,8129,,2750,3.55
```

These data correspond to the make, price, MPG, weight, and gear ratio of a few very old cars. The variable names are not in the file (so `insheet` will assign its own names), and the fields are separated by a comma. Use `insheet` to read the data:

```
. insheet using sample.csv
(5 vars, 7 obs)
. list, separator(0)
```

	v1	v2	v3	v4	v5
1.	VW Rabbit	4697	25	1930	3.78
2.	Olds 98	8814	21	4060	2.41
3.	Chev. Monza	3667	.	2750	2.73
4.		4099	22	2930	3.58
5.	Datsun 510	5079	24	2280	3.54
6.	Buick Regal	5189	20	3280	2.93
7.	Datsun 810	8129	.	2750	3.55

If you want to specify better variable names, you can include the desired names in the command:

```
. insheet make price mpg weight gear_ratio using sample.csv
(5 vars, 7 obs)
. list, separator(0)
```

	make	price	mpg	weight	gear_r~o
1.	VW Rabbit	4697	25	1930	3.78
2.	Olds 98	8814	21	4060	2.41
3.	Chev. Monza	3667	.	2750	2.73
4.		4099	22	2930	3.58
5.	Datsun 510	5079	24	2280	3.54
6.	Buick Regal	5189	20	3280	2.93
7.	Datsun 810	8129	.	2750	3.55

As a side note about displaying data, Stata listed `gear_ratio` as `gear_r~o` in the output from `list`. `gear_r~o` is a unique abbreviation for the variable `gear_ratio`. Stata displays the abbreviated variable name when variable names are longer than eight characters.

To prevent Stata from abbreviating `gear_ratio`, you could specify the `abbreviate(10)` option:

```
. list, separator(0) abbreviate(10)
```

	make	price	mpg	weight	gear_ratio
1.	VW Rabbit	4697	25	1930	3.78
2.	Olds 98	8814	21	4060	2.41
3.	Chev. Monza	3667	.	2750	2.73
4.		4099	22	2930	3.58
5.	Datsun 510	5079	24	2280	3.54
6.	Buick Regal	5189	20	3280	2.93
7.	Datsun 810	8129	.	2750	3.55

For more information on the `~` abbreviation and on `list`, see [\[GSW\] 10 Listing data and basic command syntax](#).

For this simple example, you could have copied the above file and pasted it into the Data Editor, because the Data Editor also understands the comma as the delimiter.

(Continued on next page)

infile with unformatted data

The file `afewcars.raw` contains the following lines, which we can view using the `type` command:

```
. type afewcars.raw
"VW Rabbit"      4697    25      1930    3.78
"Olds 98"        8814    21      4060    2.41
"Chev. Monza"     3667    .      2750    2.73
""              4099    22      2930    3.58
"Datsun 510"     5079    24      2280    3.54
"Buick Regal"
5189
20
3280
2.93
"Datsun 810"     8129    ***      2750    3.55
```

These correspond to the make, price, MPG, weight, and gear ratio of a few cars.

This file is a mess. It uses spaces, instead of a good special character, to delimit pieces of data. The second line is not formatted the same as the first line. The sixth car's data are spread over five lines. There are some data missing, and the missing values have different representations: the MPG on the third line has a '.', the make on the fourth line contains "", and the MPG on the last line contains '***'. The one redeeming feature of the file is that the makes of cars are quoted, so that spaces in the names, such as "Olds 98", will not make the file unreadable. The `infile` command can deal with such a messy file.

```
. infile str18 make price mpg weight gear_ratio using afewcars
'***' cannot be read as a number for mpg[7]
(7 observations read)
```

Here are some notes about this example:

- The phrase using `afewcars` in the command is interpreted by Stata to mean using `afewcars.raw`. The extension `.raw` is assumed by `infile` if you do not specify otherwise. If the data had been stored in `afewcars.txt`, you would have had to specify using `afewcars.txt`.
- `infile` does not require each observation to be on one line. The location of line breaks does not matter, because they are treated the same as a space (the computer term for this is that they are treated as *whitespace*).
- The variable names were required in this example so that `infile` could know how many variables there were. It could not have used the number of pieces of data on the first line, because it is not treating line breaks as special.
- Entries that are not understood (such as `***`) are mentioned and are stored as missing values.
- Entries that use Stata's conventions for missing values are not mentioned. There are two examples of this: '.', indicating a numeric missing value, and "", indicating a string missing value. However, with `infile` you must explicitly have a "" in your file so that it does not read the next number in the file as the value of this string variable.

infile with fixed-format data

File `cars2.raw` contains the following lines:

```
. type cars2.raw
VW Rabbit      4697      25      1930      3.78
Olds 98        8814      21      4060      2.41
Chev. Monza     3667      22      2750      2.73
               4099      22      2930      3.58
Datsun 510     5079      24      2280      3.54
Buick Regal    5189      20      3280      2.93
Datsun 810     8129      20      2750      3.55
```

These data are simple for a human to read, because they are formatted nicely, but much more difficult for the computer to read without guidance. There are two related reasons for this: there are no double quotes around the strings in the first column and they include blanks, and there are blanks in the first and third columns when the data are missing. This means that `infile` cannot use whitespace as before to know where one piece of data ends and the next begins. Trying to separate the data by using whitespace leads to a complete failure, because it assigns each chunk of text to each variable in turn:

make is	VW	in the first observation	
price is	Rabbit	in the first observation	(error, stores as missing value)
MPG is	4697	in the first observation	(wrong)
weight is	25	in the first observation	(also wrong)
gear ratio is	1930	in the first observation	(wrong again)
make is	3.78	in the second observation	(stores “3.78” as a string)
price is	Olds	in the second observation	(error, stores as missing value)
MPG is	98	in the second observation	(surprise)
:	:	:	

This problem is referred to as *loss of synchronization*.

We could solve this problem if we told `infile` that the data were nicely aligned in columns. This alignment can be passed on to `infile` in the form of a *dictionary file*. Here is a dictionary file that would work for these data. We can create it by using the Do-file Editor and save it in the file `forcars2.dct`:

```
. type forcars2.dct
dictionary using cars2.raw {
    _column(1)      str18 make      %11s
    _column(19)     price           %4f
    _column(31)     mpg             %2f
    _column(39)     weight          %4f
    _column(47)     gear_ratio      %4f
}
```

You can see that the column numbers tell `infile` where to start reading each variable. Furthermore, the dictionary contains the name of the file for which it was made. The details of constructing dictionaries are described in [\[D\] infile \(fixed format\)](#). To read the data, type

```
. infile using forcars2
dictionary using cars2.raw {
    _column(1)      str18 make      %11s
    _column(19)     price          %4f
    _column(31)     mpg            %2f
    _column(39)     weight         %4f
    _column(47)     gear_ratio     %4f
}
(7 observations read)
. list
```

	make	price	mpg	weight	gear_r~o
1.	VW Rabbit	4697	25	1930	3.78
2.	Olds 98	8814	21	4060	2.41
3.	Chev. Monza	3667	.	2750	2.73
4.		4099	22	2930	3.58
5.	Datsun 510	5079	24	2280	3.54
6.	Buick Regal	5189	20	3280	2.93
7.	Datsun 810	8129	.	2750	3.55

The `infile` command uses a dictionary because no variables are specified. It adds a file extension, `.dct`, when no extension is specified.

Stata has a second command, `infix`, for reading fixed-format files. Its full documentation is in [\[D\] infix \(fixed format\)](#).

Importing files from other software

Stata has some more specialized methods for reading data that were created or stored in another format. These are useful when you do not have control over the format in which the data are distributed.

The `fdause` command can read and create SAS XPORT Transport files. See `fdause` and `fdasave` in [\[D\] fdasave](#) for full details.

If you have software that supports ODBC (*Open Database Connectivity*), you can read data by using the `odbc` command without the need to create interim files. See [\[D\] odbc](#) for full details.

If you would like to move data by using XML (*Extensible Markup Language*), Stata has the `xmluse` and `xmlsave` commands available. See `xmluse` and `xmlsave` in [\[D\] xmlsave](#) for full details.

Here is a brief summary of the choices:

- If you have a table, you could try copying it and pasting into the Data Editor.
- If you have a file exported from a spreadsheet or database application to a tab-delimited or CSV file, use `insheet`.
- If you have a free-format, space-delimited file, use `infile` with variable names.
- If you have a fixed-format file, either use `infile` with a dictionary or use `infix`.
- If you have a SAS XPORT file, use `fdause`.
- If you have a database accessible via ODBC, use `odbc`.
- If you have an XML file, use `xmluse`.
- Finally, you can purchase a transfer program that will convert the other software’s data file format to Stata’s data file format. See [\[U\] 21.4 Transfer programs](#).

9 Labeling data

Making data readable

This chapter discusses, in brief, labeling of the dataset, variables, and values. Such labeling is critical to careful use of data. Labeling variables with descriptive names clarifies their meanings. Labeling values within categorical variables keeps the true meanings of the categories from becoming obscure. These points are crucial when sharing data with others, including your future self. Labels are also used in the output of most Stata commands, so proper labeling of the dataset will make much more readable results. We will work through an example of properly labeling a dataset, its variables, and the values of one encoded variable.

The dataset structure: The describe command

In [GSW] 8 Importing data, we saved a dataset called `afewcars.dta`. We will get this dataset into a shape that a colleague would understand. Let’s see what it contains.

```
. use fewcars
. list, separator(0)
```

	make	price	mpg	weight	gear_r~o
1.	VW Rabbit	4697	25	1930	3.78
2.	Olds 98	8814	21	4060	2.41
3.	Chev. Monza	3667	.	2750	2.73
4.		4099	22	2930	3.58
5.	Datsun 510	5079	24	2280	3.54
6.	Buick Regal	5189	20	3280	2.93
7.	Datsun 810	8129	.	2750	3.55

The data allow us to make some guesses at the values in the dataset, but, for example, we do not know the units in which the price or weight is measured, and the term “mpg” could be confusing for people outside the United States. Perhaps we can learn something from the description of the dataset. Stata has the aptly named `describe` command for this purpose (as we saw in [GSW] 1 Introducing Stata—sample session).

(Continued on next page)

```
. describe
Contains data from afewcars.dta
  obs:           7
  vars:           5                      11 May 2009 20:47
  size:          294 (99.9% of memory free)
```

variable name	storage type	display format	value label	variable label
make	str18	%18s		
price	float	%9.0g		
mpg	float	%9.0g		
weight	float	%9.0g		
gear_ratio	float	%9.0g		

```
Sorted by:
```

Though there is precious little information that could help us as a researcher, we can glean some information here about how Stata thinks of the data from the first three columns of the output.

1. The *variable name* is the name we use to tell Stata about a variable.
2. The *storage type* (otherwise known as the *data type*) is the way in which Stata stores the data in a variable. There are six different storage types:
 - a. For integers:
 - `byte` for integers between -127 and 100
 - `int` for integers between $-32,767$ and $32,740$
 - `long` for integers between $-2,147,483,647$ and $2,147,483,620$
 - b. For real numbers:
 - `float` for real numbers with 8.5 digits of precision
 - `double` for real numbers with 16.5 digits of precision
 - c. For strings (text) from 1–244 characters:
 - `str1` for one-character-long strings
 - `str2` for two-character-long strings
 - `str3` for three-character-long strings
 - ...
 - `str244` for 244-character-long strings

Storage types affect both the precision of computations and the size of datasets. A quick guide to storage types is available at `help datatype` or in [D] **data types**.

3. The *display format* controls how the variable is displayed; see [U] **12.5 Formats: Controlling how data are displayed**. By default, Stata sets it to something reasonable given the storage type. We would like to make this dataset into something containing all the information we need.

To see what a well-labeled dataset looks like, we can take a look at a dataset stored at the Stata Press repository. We need not load the data (and disturb what we are doing); we do not even need a copy of the dataset on our machine. (You will learn more about Stata's Internet capabilities in [GSW] **19 Updating and extending Stata—Internet functionality**.) All we need to do is direct `describe` to look at the proper file by using the command `describe using filename`.

```
. describe using http://www.stata-press.com/data/r11/auto
```

Contains data 1978 Automobile Data
 obs: 74 13 Apr 2009 17:45
 vars: 12
 size: 3,478

variable name	storage type	display format	value label	variable label
make	str18	%-18s		Make and Model
price	int	%8.0gc		Price
mpg	int	%8.0g		Mileage (mpg)
rep78	int	%8.0g		Repair Record 1978
headroom	float	%6.1f		Headroom (in.)
trunk	int	%8.0g		Trunk space (cu. ft.)
weight	int	%8.0gc		Weight (lbs.)
length	int	%8.0g		Length (in.)
turn	int	%8.0g		Turn Circle (ft.)
displacement	int	%8.0g		Displacement (cu. in.)
gear_ratio	float	%6.2f		Gear Ratio
foreign	byte	%8.0g	origin	Car type

Sorted by: **foreign**

This output is much more informative. There are three locations where labels are attached that help explain what the dataset contains:

1. In the first line, 1978 Automobile Data is the *data label*. It gives information about the contents of the dataset. Data can be labeled by selecting **Data > Data utilities > Label utilities > Label dataset** or by using the `label data` command.
2. There is a *variable label* attached to each variable. Variable labels are not only how we would refer to the variable in normal, everyday conversation, but they also contain information about the units of the variables. Variables can be labeled by right-clicking on the variable in the Variables window and selecting **Edit Variable Label for 'varname'...**, by using the Variables Manager, or by using the `label variable` command.
3. The `foreign` variable has an attached *value label*. Value labels allow numeric variables, such as `foreign`, to have words associated with numeric codes. The `describe` output tells you that the numeric variable `foreign` has value label `origin` associated with it. Although not revealed by `describe`, the variable `foreign` takes on the values 0 and 1, and the value label `origin` associates 0 with Domestic and 1 with Foreign. If you browse the data (see [\[GSW\] 6 Using the Data Editor](#)), `foreign` appears to contain the values “Domestic” and “Foreign”. The values in a variable are labeled in two stages. The value label must first be defined. This can be done in the Data Editor, the Variables Manager, by selecting **Data > Data utilities > Label utilities > Manage value labels** or by typing the `label define` command. After the labels have been defined, they must be attached to the proper variables either by selecting **Data > Data utilities > Label utilities > Assign value label to variables** or by using the `label values` command. One note: It is not necessary for the value label to have a name different from that of the variable. You could just as easily have used a value label named `foreign`.

(Continued on next page)

Labeling datasets and variables

We will now take our `afewcars.dta` dataset and give it proper labels. We will do this via the Command window, because it is simple to do in this fashion. If you use the menus and dialogs, the Data Editor, the Variables Manager, or any other GUI element, you will end up with the same commands in your log.

```
. use fewcars
. describe
Contains data from fewcars.dta
  obs:          7
  vars:         5
  size:        294 (99.9% of memory free)
11 May 2009 20:47
```

variable name	storage type	display format	value label	variable label
make	str18	%18s		
price	float	%9.0g		
mpg	float	%9.0g		
weight	float	%9.0g		
gear_ratio	float	%9.0g		

```
Sorted by:
. label data "A few 1978 cars"
. label variable make "Make and Model"
. label variable price "Price (USD)"
. label variable mpg "Mileage (mile per gallon)"
. label variable weight "Vehicle weight (lbs.)"
. label variable gear_ratio "Gear Ratio"
. describe
```

```
Contains data from fewcars.dta
  obs:          7
  vars:         5
  size:        294 (99.9% of memory free)
A few 1978 cars
11 May 2009 20:47
```

variable name	storage type	display format	value label	variable label
make	str18	%18s		Make and Model
price	float	%9.0g		Price (USD)
mpg	float	%9.0g		Mileage (mile per gallon)
weight	float	%9.0g		Vehicle weight (lbs.)
gear_ratio	float	%9.0g		Gear Ratio

```
Sorted by:
. save, replace
file fewcars.dta saved
```

Warning: When you change or define labels on a dataset in memory, it is worth saving the dataset right away. Because the actual data in the dataset did not change, Stata will not prevent you from exiting or loading a new dataset later, and you will lose your labels.

Labeling values of variables

Suppose that we now added a new indicator variable to the dataset that is 0 if the car was made in the United States and 1 if it was foreign made. Our data would now look like this:

```
. list, separator(0)
```

	make	price	mpg	weight	gear_ratio	foreign
1.	VW Rabbit	4697	25	1930	3.78	1
2.	Olds 98	8814	21	4060	2.41	0
3.	Chev. Monza	3667	.	2750	2.73	0
4.		4099	22	2930	3.58	0
5.	Datsun 510	5079	24	2280	3.54	1
6.	Buick Regal	5189	20	3280	2.93	0
7.	Datsun 810	8129	.	2750	3.55	1

Though the definitions of the categories “0” and “1” are clear in this context, it still would be worthwhile to give the values explicit labels, because it will make output clear to people who are not so familiar with antique automobiles. This is done with a value label.

We saw an example of creating and attaching a value label by using the point-and-click interface available in the Data Editor in [Changing data](#) in [\[GSW\] 6 Using the Data Editor](#). Here we’ll do it directly from the Command window.

```
. label define origin 0 "domestic" 1 "foreign"
```

```
. label values foreign origin
```

```
. describe
```

Contains data from **afewcars.dta**

obs:	7	A few 1978 cars
vars:	6	11 May 2009 20:47
size:	301 (99.9% of memory free)	

variable name	storage type	display format	value label	variable label
make	str18	%18s		Make and Model
price	float	%9.0g		Price (USD)
mpg	float	%9.0g		Mileage (mile per gallon)
weight	float	%9.0g		Vehicle weight (lbs.)
gear_ratio	float	%9.0g		Gear Ratio
foreign	byte	%8.0g	origin	

Sorted by:

Note: dataset has changed since last saved

```
. save, replace
```

file **afewcars.dta** saved

From this, we can see that a value label is defined via

```
label define labelname # "contents" # "contents" ...
```

It can then be attached to a variable via

```
label values variablename labelname
```

Once again, we need to save the dataset to be sure that we do not mistakenly lose the labels later.

If you had wanted to define the value labels by using a point-and-click interface, the easiest way to do that would be to open the Variables Manager by clicking on the **Variables Manager** button, , and then manage labels. See [GSW] 7 Using the Variables Manager for more information.

There is more to value labels than what was covered here; see [U] 12.6.3 Value labels for a complete treatment.

You may also add notes to your data and your variables. This feature was discussed in **Managing notes** in [GSW] 7 Using the Variables Manager. You can learn more about notes by typing `help notes` or you can get the full story in [D] notes.

10 Listing data and basic command syntax

Command syntax

This chapter gives a basic lesson on Stata's command syntax while showing how to control the appearance of a data list.

As we have seen throughout this manual, you have a choice between using menus and dialogs and using the Command window. Although many find the menus more natural and the Command window baffling at first, some practice makes working via the Command window often much faster than using menus and dialogs. The Command window can become a faster way of working because of the clean and regular syntax of Stata commands. We will cover enough to get you started; [help language](#) has more information and examples, and [\[U\] 11 Language syntax](#) has all the details.

The syntax for the `list` command can be seen by typing `help list`:

```
list [varlist] [if] [in] [, options]
```

Here is how to read this syntax:

- Anything inside square brackets is optional. For the `list` command,
 - a. *varlist* is optional. A *varlist* is a list of variable names.
 - b. *if* is optional. The *if* qualifier restricts the command to run only on those observations for which the qualifier is true. We saw examples of this in [\[GSW\] 6 Using the Data Editor](#).
 - c. *in* is optional. The *in* qualifier restricts the command to run on particular observation numbers.
 - d. `,` and *options* are optional. *options* are separated from the rest of the command by a comma.
- Optional pieces do not preclude one another unless explicitly stated. For the `list` command, it is possible to use a *varlist* with *if* and *in*.
- If a part of a word is underlined, the underlined part is the minimum abbreviation. Any abbreviation at least this long is acceptable.
 - a. The `l` in `list` is underlined, so `l`, `li`, and `lis` are all equivalent to `list`.
- Anything not inside square brackets is required. For the `list` command, only the command itself is required.

Keeping these rules in mind, let's investigate how `list` behaves when called with different arguments. We will be using the dataset `afewcars.dta` from the end of the previous chapter.

list with a variable list

Variable lists (or *varlists*) can be specified in a variety of ways, all designed to save typing and encourage good variable names.

- The *varlist* is optional for `list`. This means that if no variables are specified, it is equivalent to specifying all variables. Another way to think of it is that the default behavior of the command is to run on all variables, unless restricted by a *varlist*.
- You can list a subset of variables explicitly, as in `list make mpg price`.
- There are also many shorthand notations:
 - `m*` means all variables starting with `m`.
 - `price-weight` means all variables from `price` through `weight` in dataset order.
 - `ma?e` means all variables starting with `ma`, followed by any character, and ending in `e`.

- You can list a variable by using an abbreviation unique to that variable, as in `list gear_r~o`. If the abbreviation is not unique, Stata returns an error message.

. list

	make	price	mpg	weight	gear_r~o	foreign
1.	VW Rabbit	4697	25	1930	3.78	foreign
2.	Olds 98	8814	21	4060	2.41	domestic
3.	Chev. Monza	3667	.	2750	2.73	domestic
4.		4099	22	2930	3.58	domestic
5.	Datsun 510	5079	24	2280	3.54	foreign
6.	Buick Regal	5189	20	3280	2.93	domestic
7.	Datsun 810	8129	.	2750	3.55	foreign

. l make mpg price

	make	mpg	price
1.	VW Rabbit	25	4697
2.	Olds 98	21	8814
3.	Chev. Monza	.	3667
4.		22	4099
5.	Datsun 510	24	5079
6.	Buick Regal	20	5189
7.	Datsun 810	.	8129

. list m*

	make	mpg
1.	VW Rabbit	25
2.	Olds 98	21
3.	Chev. Monza	.
4.		22
5.	Datsun 510	24
6.	Buick Regal	20
7.	Datsun 810	.

. li price-weight

	price	mpg	weight
1.	4697	25	1930
2.	8814	21	4060
3.	3667	.	2750
4.	4099	22	2930
5.	5079	24	2280
6.	5189	20	3280
7.	8129	.	2750

```
. list ma?e
```

	make
1.	VW Rabbit
2.	Olds 98
3.	Chev. Monza
4.	
5.	Datsun 510
6.	Buick Regal
7.	Datsun 810

```
. l gear_r~o
```

	gear_r~o
1.	3.78
2.	2.41
3.	2.73
4.	3.58
5.	3.54
6.	2.93
7.	3.55

list with if

The `if` qualifier uses a logical expression to determine which observations to use. If the expression is true, the observation is used in the command; otherwise, it is skipped. The operators whose results are either true or false are

<	less than
<=	less than or equal
==	equal
>	greater than
>=	greater than or equal
!=	not equal
&	and
	or
!	not (logical negation; ~ can also be used)
()	parentheses are for grouping to specify order of evaluation

In the logical expressions, `&` is evaluated before `|` (similar to multiplication before addition in arithmetic). You can use this in your expressions, but it is often better to use parentheses to ensure that the expressions are evaluated properly. See [\[U\] 13.2 Operators](#) for the complete story.

. list

	make	price	mpg	weight	gear_r~o	foreign
1.	VW Rabbit	4697	25	1930	3.78	foreign
2.	Olds 98	8814	21	4060	2.41	domestic
3.	Chev. Monza	3667	.	2750	2.73	domestic
4.		4099	22	2930	3.58	domestic
5.	Datsun 510	5079	24	2280	3.54	foreign
6.	Buick Regal	5189	20	3280	2.93	domestic
7.	Datsun 810	8129	.	2750	3.55	foreign

. list if mpg > 22

	make	price	mpg	weight	gear_r~o	foreign
1.	VW Rabbit	4697	25	1930	3.78	foreign
3.	Chev. Monza	3667	.	2750	2.73	domestic
5.	Datsun 510	5079	24	2280	3.54	foreign
7.	Datsun 810	8129	.	2750	3.55	foreign

. list if (mpg > 22) & !missing(mpg)

	make	price	mpg	weight	gear_r~o	foreign
1.	VW Rabbit	4697	25	1930	3.78	foreign
5.	Datsun 510	5079	24	2280	3.54	foreign

. list make mpg price gear if (mpg > 22) | (price > 8000 & gear < 3.5)

	make	mpg	price	gear_r~o
1.	VW Rabbit	25	4697	3.78
2.	Olds 98	21	8814	2.41
3.	Chev. Monza	.	3667	2.73
5.	Datsun 510	24	5079	3.54
7.	Datsun 810	.	8129	3.55

. list make mpg if mpg <= 22 in 2/4

	make	mpg
2.	Olds 98	21
4.		22

In the listings above, we see more examples of Stata treating missing numerical values as large values, as well as the care that should be taken when the `if` qualifier is applied to a variable with missing values. See [\[GSW\] 6 Using the Data Editor](#).

list with if, common mistakes

Here is a series of listings with common errors and their corrections. See if you can find the errors before reading the correct entry.

```
. list
```

	make	price	mpg	weight	gear_r~o	foreign
1.	VW Rabbit	4697	25	1930	3.78	foreign
2.	Olds 98	8814	21	4060	2.41	domestic
3.	Chev. Monza	3667	.	2750	2.73	domestic
4.		4099	22	2930	3.58	domestic
5.	Datsun 510	5079	24	2280	3.54	foreign
6.	Buick Regal	5189	20	3280	2.93	domestic
7.	Datsun 810	8129	.	2750	3.55	foreign

```
. list if mpg==21
=exp not allowed
r(101);
```

The error arises because “equal” is expressed by ==, not by =. Corrected, it becomes

```
. list if mpg==21
```

	make	price	mpg	weight	gear_r~o	foreign
2.	Olds 98	8814	21	4060	2.41	domestic

Other common errors with logic:

```
. list if mpg==21 if weight > 4000
invalid syntax
r(198);

. list if mpg==21 and weight > 4000
invalid 'and'
r(198);
```

Joint tests are specified with &, not with the word and or multiple ifs. The if qualifier should be if mpg==21 & weight>4000, not if mpg==21 if weight>4000. Here is its correction:

```
. list if mpg==21 & weight > 4000
```

	make	price	mpg	weight	gear_r~o	foreign
2.	Olds 98	8814	21	4060	2.41	domestic

A problem with string variables:

```
. list if make==Datsun 510
Datsun not found
r(111);
```

Strings must be in double quotes, as in `make=="Datsun 510"`. Without the quotes, Stata thinks that `Datsun` is a variable that it cannot find. Here is the correction:

```
. list if make=="Datsun 510"
```

	make	price	mpg	weight	gear_r~o	foreign
5.	Datsun 510	5079	24	2280	3.54	foreign

Confusing value labels with strings:

```
. list if foreign=="domestic"
type mismatch
r(109);
```

Value labels look like strings but the underlying variable is numeric. Variable `foreign` takes on values 0 and 1 but has the value label that attaches 0 to “domestic” and 1 to “foreign” (see [\[GSW\] 9 Labeling data](#)). To see the underlying numeric values of variables with labeled values, use the `label list` command (see [\[D\] label](#)), or investigate the variable with codebook `varname`. We can correct the error here by looking for observations where `foreign==0`.

There is a second construction that also allows the use of the value label directly.

```
. list if foreign==0
```

	make	price	mpg	weight	gear_r~o	foreign
2.	Olds 98	8814	21	4060	2.41	domestic
3.	Chev. Monza	3667	.	2750	2.73	domestic
4.		4099	22	2930	3.58	domestic
6.	Buick Regal	5189	20	3280	2.93	domestic

```
. list if foreign=="domestic":origin
```

	make	price	mpg	weight	gear_r~o	foreign
2.	Olds 98	8814	21	4060	2.41	domestic
3.	Chev. Monza	3667	.	2750	2.73	domestic
4.		4099	22	2930	3.58	domestic
6.	Buick Regal	5189	20	3280	2.93	domestic

list with in

The `in` qualifier uses a *numlist* to give a range of observations that should be listed. *numlists* have the form of one number or *first/last*. Positive numbers count from the beginning of the dataset. Negative numbers count from the end of the dataset. Here are some examples:

```
. list
```

	make	price	mpg	weight	gear_r~o	foreign
1.	VW Rabbit	4697	25	1930	3.78	foreign
2.	Olds 98	8814	21	4060	2.41	domestic
3.	Chev. Monza	3667	.	2750	2.73	domestic
4.		4099	22	2930	3.58	domestic
5.	Datsun 510	5079	24	2280	3.54	foreign
6.	Buick Regal	5189	20	3280	2.93	domestic
7.	Datsun 810	8129	.	2750	3.55	foreign

```
. list in 1
```

	make	price	mpg	weight	gear_r~o	foreign
1.	VW Rabbit	4697	25	1930	3.78	foreign

```
. list in -1
```

	make	price	mpg	weight	gear_r~o	foreign
7.	Datsun 810	8129	.	2750	3.55	foreign

```
. list in 2/4
```

	make	price	mpg	weight	gear_r~o	foreign
2.	Olds 98	8814	21	4060	2.41	domestic
3.	Chev. Monza	3667	.	2750	2.73	domestic
4.		4099	22	2930	3.58	domestic

```
. list in -3/-2
```

	make	price	mpg	weight	gear_r~o	foreign
5.	Datsun 510	5079	24	2280	3.54	foreign
6.	Buick Regal	5189	20	3280	2.93	domestic

Controlling the list output

The fine control over `list` output is exercised by specifying one or more options. You can use `sepyby()` to separate observations by variable. `abbreviate()` specifies the minimum number of characters to abbreviate a variable in the output. `divider` draws a vertical line between the variables in the list.

```
. sort foreign
. list ma p g f, sepby(foreign)
```

	make	price	gear_r~o	foreign
1.	Chev. Monza	3667	2.73	domestic
2.	Olds 98	8814	2.41	domestic
3.		4099	3.58	domestic
4.	Buick Regal	5189	2.93	domestic
5.	VW Rabbit	4697	3.78	foreign
6.	Datsun 510	5079	3.54	foreign
7.	Datsun 810	8129	3.55	foreign

```
. list make weight gear, abbreviate(10)
```

	make	weight	gear_ratio
1.	Chev. Monza	2750	2.73
2.	Olds 98	4060	2.41
3.		2930	3.58
4.	Buick Regal	3280	2.93
5.	VW Rabbit	1930	3.78
6.	Datsun 510	2280	3.54
7.	Datsun 810	2750	3.55

```
. list, divider
```

	make	price	mpg	weight	gear_r~o	foreign
1.	Chev. Monza	3667	.	2750	2.73	domestic
2.	Olds 98	8814	21	4060	2.41	domestic
3.		4099	22	2930	3.58	domestic
4.	Buick Regal	5189	20	3280	2.93	domestic
5.	VW Rabbit	4697	25	1930	3.78	foreign
6.	Datsun 510	5079	24	2280	3.54	foreign
7.	Datsun 810	8129	.	2750	3.55	foreign

The `separator()` option draws a horizontal line at specified intervals. When not specified, it defaults to a value of 5.

```
. list, separator(3)
```

	make	price	mpg	weight	gear_r~o	foreign
1.	Chev. Monza	3667	.	2750	2.73	domestic
2.	Olds 98	8814	21	4060	2.41	domestic
3.		4099	22	2930	3.58	domestic
4.	Buick Regal	5189	20	3280	2.93	domestic
5.	VW Rabbit	4697	25	1930	3.78	foreign
6.	Datsun 510	5079	24	2280	3.54	foreign
7.	Datsun 810	8129	.	2750	3.55	foreign

More

When you see a **—more—** prompt at the bottom of the Results window, it means that there is more information to be displayed. This happens, for example, when you are listing many observations.

```
. list make mpg
```

	make	mpg
1.	Linc. Continental	12
2.	Linc. Mark V	12
3.	Cad. Deville	14
4.	Cad. Eldorado	14
5.	Linc. Versailles	14
6.	Merc. Cougar	14
7.	Merc. XR-7	14
8.	Peugeot 604	14
9.	Buick Electra	15
10.	Merc. Marquis	15
11.	Buick Riviera	16
12.	Chev. Impala	16
13.	Dodge Magnum	16
14.	Olds Toronado	16
15.	AMC Pacer	17
16.	Audi 5000	17
17.	Dodge St. Regis	17
18.	Volvo 260	17
19.	Buick LeSabre	18
20.	Dodge Diplomat	18

—more—

If you want to see the next screen of text, you have a few options: press any key, such as the Spacebar; click on the **More** button, ; or click on the blue **—more—** at the bottom of the Results window. To see just the next line of text, press *Enter*.

Break

If you want to interrupt a Stata command, click on the **Break** button, . If you see a `—more—` prompt at the bottom of the Results window and wish to interrupt it, click on the **Break** button or press `q`.

```
. list make mpg
```

	make	mpg
1.	Linc. Continental	12
2.	Linc. Mark V	12
3.	Cad. Deville	14
4.	Cad. Eldorado	14
5.	Linc. Versailles	14
6.	Merc. Cougar	14
7.	Merc. XR-7	14
8.	Peugeot 604	14
9.	Buick Electra	15
10.	Merc. Marquis	15
11.	Buick Riviera	16
12.	Chev. Impala	16
13.	Dodge Magnum	16
14.	Olds Toronado	16
15.	AMC Pacer	17
16.	Audi 5000	17
17.	Dodge St. Regis	17
18.	Volvo 260	17
19.	Buick LeSabre	18
20.	Dodge Diplomat	18

```
—break—  
r(1);
```

It is always safe to click on the **Break** button. After you click on **Break**, the state of the system is the same as if you had never issued the original command.

11 Creating new variables

generate and replace

This chapter shows the basics of creating and modifying variables in Stata. We saw how to work with the Data Editor in [\[GSW\] 6 Using the Data Editor](#)—this chapter shows how we would do this from the Command window. The two primary commands used for this are

- **generate** for creating new variables. It has a minimum abbreviation of **g**.
- **replace** for replacing the values of an existing variable. It may not be abbreviated, because it alters existing data and hence can be considered dangerous.

The most basic form for creating new variables is **generate newvar = exp**, where *exp* is any kind of *expression*. Both **generate** and **replace** can be used with **if** and **in** qualifiers, of course. An expression is a formula made up of constants, existing variables, operators, and functions. Some examples of expressions (using variables from the `auto` dataset) would be `2 + price`, `weight^2`, or `sqrt(gear_ratio)`.

The operators defined in Stata are given in the table below:

Arithmetic		Logical		Relational (numeric and string)	
+	addition	!	not	>	greater than
-	subtraction		or	<	less than
*	multiplication	&	and	>=	> or equal
/	division			<=	< or equal
^	power			==	equal
				!=	not equal
+	string concatenation				

Stata has many mathematical, statistical, string, date, time-series, and programming functions. See [help functions](#) for the basics, and see [\[D\] functions](#) for a complete list and full details of all the built-in functions.

You can use menus and dialog boxes to create new variables and modify existing variables by selecting menu items from the **Data > Create or change data** menu. This feature can be handy for finding functions quickly. We will use the Command window for the examples in this chapter, however, because we would like to illustrate simple usage and some pitfalls.

generate

There are some details you should know about the **generate** command:

- The basic form of the **generate** command is **generate newvar = exp**, where *newvar* is a new variable name, and *exp* is any valid expression. You will get an error message if you try to **generate** a variable that already exists.
- An algebraic calculation using a missing value yields a missing value, as does division by zero, etc.

- If missing values are generated, the number of missing values in *newvar* is always reported. If Stata says nothing about missing values, then no missing values were generated.
- You can use `generate` to set the storage type of the new variable as it is generated. Saving an indicator variable as a byte can save size when used with a large dataset.

Here are some examples of creating new variables from the `afewcars` dataset that we have been using for the past few chapters. Some are nonsensical—they are only for illustrating the `generate` command. The last example shows a way to generate an indicator variable for cars weighing more than 3,000 pounds. Logical expressions in Stata result in “1” for “true” and “0” for “false.” The `if` qualifier is needed to be sure that the computations are done only for observations where `weight` is not missing.

```
. list make mpg weight
```

	make	mpg	weight
1.	VW Rabbit	25	1930
2.	Olds 98	21	4060
3.	Chev. Monza	.	2750
4.		22	2930
5.	Datsun 510	24	2280
6.	Buick Regal	20	3280
7.	Datsun 810	.	2750

```
. generate lphk = 3.7854 * (100 / 1.6093) / mpg
(2 missing values generated)
. label var lphk "Liters per 100km"
. g strange = sqrt(mpg*weight)
(2 missing values generated)
. gen huge = weight >= 3000 if !missing(weight)
. l make mpg weight lphk strange huge
```

	make	mpg	weight	lphk	strange	huge
1.	VW Rabbit	25	1930	9.408812	219.6588	0
2.	Olds 98	21	4060	11.20097	291.9932	1
3.	Chev. Monza	.	2750	.	.	0
4.		22	2930	10.69183	253.8897	0
5.	Datsun 510	24	2280	9.800845	233.9231	0
6.	Buick Regal	20	3280	11.76101	256.125	1
7.	Datsun 810	.	2750	.	.	0

replace

Whereas **generate** is used to create new variables, **replace** is the command used for existing variables. Stata uses two different commands to prevent you from accidentally modifying your data. The **replace** command cannot be abbreviated. Stata generally requires you to spell out completely any command that can alter your existing data.

```
. list make weight
```

	make	weight
1.	VW Rabbit	1930
2.	Olds 98	4060
3.	Chev. Monza	2750
4.		2930
5.	Datsun 510	2280
6.	Buick Regal	3280
7.	Datsun 810	2750

```
. gen weight = weight/1000
```

```
weight already defined
```

```
r(110);
```

```
. replace weight = weight/1000
```

```
(7 real changes made)
```

```
. list make weight
```

	make	weight
1.	VW Rabbit	1.93
2.	Olds 98	4.06
3.	Chev. Monza	2.75
4.		2.93
5.	Datsun 510	2.28
6.	Buick Regal	3.28
7.	Datsun 810	2.75

Suppose that you want to create a new variable, **predprice**, which will be the predicted price of the cars in the following year. You estimate that domestic cars will increase in price by 5% and foreign cars, by 10%.

One way to create the variable would be to first use **generate** to compute the predicted domestic car prices. Then use **replace** to change the missing values for the foreign cars to their proper values.

(Continued on next page)

```
. gen predprice = 1.05*price if foreign==0
(3 missing values generated)
. replace predprice = 1.10*price if foreign==1
(3 real changes made)
. list make foreign price predprice, nolabel
```

	make	foreign	price	predpr-e
1.	VW Rabbit	1	4697	5166.7
2.	Olds 98	0	8814	9254.7
3.	Chev. Monza	0	3667	3850.35
4.		0	4099	4303.95
5.	Datsun 510	1	5079	5586.9
6.	Buick Regal	0	5189	5448.45
7.	Datsun 810	1	8129	8941.9

Of course, because foreign is an indicator variable, we could generate the predicted variable with one command:

```
. gen predprice2 = (1.05 + 0.05*foreign)*price
. list make foreign price predprice predprice2, nolabel
```

	make	foreign	price	predpr-e	predpr-2
1.	VW Rabbit	1	4697	5166.7	5166.7
2.	Olds 98	0	8814	9254.7	9254.7
3.	Chev. Monza	0	3667	3850.35	3850.35
4.		0	4099	4303.95	4303.95
5.	Datsun 510	1	5079	5586.9	5586.9
6.	Buick Regal	0	5189	5448.45	5448.45
7.	Datsun 810	1	8129	8941.9	8941.9

generate with string variables

Stata is smart. When you generate a variable and the expression evaluates to a string, Stata creates a string variable with a storage type as long as necessary, and no longer than that. `where` is a `str1` in the following example.

```
. list make foreign
```

	make	foreign
1.	VW Rabbit	foreign
2.	Olds 98	domestic
3.	Chev. Monza	domestic
4.		domestic
5.	Datsun 510	foreign
6.	Buick Regal	domestic
7.	Datsun 810	foreign

```
. gen where = "D" if foreign=="domestic":origin
(3 missing values generated)
```

```
. replace where = "F" if foreign=="foreign":origin
(3 real changes made)
```

```
. list make foreign where
```

	make	foreign	where
1.	VW Rabbit	foreign	F
2.	Olds 98	domestic	D
3.	Chev. Monza	domestic	D
4.		domestic	D
5.	Datsun 510	foreign	F
6.	Buick Regal	domestic	D
7.	Datsun 810	foreign	F

```
. describe where
```

	storage	display	value	
variable name	type	format	label	variable label
where	str1	%9s		

Stata has some useful tools for working with string variables. Here we split the `make` variable into `make` and `model`, and then create a variable that has the model together with where the model was manufactured.

(Continued on next page)

```
. gen model = substr(make, strpos(make,"")+1, .)
(1 missing value generated)
. gen modelwhere = model + " " + where
. list make where model modelwhere
```

	make	where	model	modelw~e
1.	VW Rabbit	F	Rabbit	Rabbit F
2.	Olds 98	D	98	98 D
3.	Chev. Monza	D	Monza	Monza D
4.		D		D
5.	Datsun 510	F	510	510 F
6.	Buick Regal	D	Regal	Regal D
7.	Datsun 810	F	810	810 F

There are a few things to note about how these commands worked:

1. `strpos(s1,s2)` produces an integer equal to the first position in *s*₁ at which *s*₂ is found, or 0 if it is not found.
2. `substr(s,c0,c1)` produces a string of length *c*₁ beginning with the *c*₀th character of *s*. If *c*₁ = ., it gives a string from character *c*₀ to the end of string.
3. Putting 1 and 2 together: `substr(s,strpos(s,"")+1,.)` produces *s* with its first word removed. Since `make` contains both the make and model of each car, and `make` contains no spaces in this dataset, we have found each car's model.
4. The operator '+', when applied to string variables, will concatenate the strings (i.e., join them together). The expression `"this" + "that"` results in the string `"thisthat"`. When the variable `modelwhere` was generated, a space (" ") was added between the two strings.
5. The missing value for a string is nothing special—it is simply the empty string "". Thus the value of `modelwhere` for the car with no make or model is " D" (note the leading space).

12 Deleting variables and observations

clear, drop, and keep

In this chapter, we will present the tools for paring observations and variables from a dataset. We saw how to do this using the Data Editor in [GSW] 6 [Using the Data Editor](#); this chapter presents the methods for doing so from the Command window.

There are three main commands for removing data and other Stata objects from memory: `clear`, `drop`, and `keep`. Remember that they affect only what is in memory. None of these commands alters anything that has been saved to disk.

clear and drop _all

Suppose that you are working on an analysis or a simulation and you need to clear out Stata's memory so that you can impute different values or simulate a new dataset. You are not interested in saving any of the changes you have made to the dataset in memory—you would just like to have an empty dataset. What you do depends on how much you want to clear out: at any time, you can have not only data but also metadata such as value labels, saved results from previous commands, and saved matrices. The `clear` command will let you carefully clear out data or other objects; we are interested only in simple usage here. For more information, see `help clear` and [D] [clear](#).

If you type the command `clear` into the Command window, it will remove all variables and value labels. In basic usage, this is typically enough. It has the nice property that it does not remove any saved results, so you can load a new dataset and predict values by using saved estimation results from a model fit on a previous dataset. See `help postest` and [U] 20 [Estimation and postestimation commands](#) for more information.

If you want to be sure that everything is cleared out, use the command `clear all`. This will clear Stata's memory of data and all auxiliary objects so that you can start with a clean slate. The first time you use `clear all` while you have a graph or dialog open, you may be surprised when that graph or dialog closes; this is necessary so that Stata can free all memory that is being used.

If you want to get rid of just the data and nothing else, you can use the command `drop _all`.

drop

The `drop` command is used to remove variables or observations from the dataset in memory.

- If you want to drop variables, use `drop varlist`.
- If you want to drop observations, use `drop` with an `if` or an `in` qualifier, or both.

(Continued on next page)

We will use the `afewcars` dataset, as usual.

```
. use afewcars
(A few 1978 cars)
. list
```

	make	price	mpg	weight	gear_ratio	foreign
1.	VW Rabbit	4697	25	1930	3.78	foreign
2.	Olds 98	8814	21	4060	2.41	domestic
3.	Chev. Monza	3667	.	2750	2.73	domestic
4.		4099	22	2930	3.58	domestic
5.	Datsun 510	5079	24	2280	3.54	foreign
6.	Buick Regal	5189	20	3280	2.93	domestic
7.	Datsun 810	8129	.	2750	3.55	foreign

```
. drop in 1/3
(3 observations deleted)
. list
```

	make	price	mpg	weight	gear_ratio	foreign
1.		4099	22	2930	3.58	domestic
2.	Datsun 510	5079	24	2280	3.54	foreign
3.	Buick Regal	5189	20	3280	2.93	domestic
4.	Datsun 810	8129	.	2750	3.55	foreign

```
. drop if mpg > 21
(3 observations deleted)
. list
```

	make	price	mpg	weight	gear_ratio	foreign
1.	Buick Regal	5189	20	3280	2.93	domestic

```
. drop gear_ratio
. list
```

	make	price	mpg	weight	foreign
1.	Buick Regal	5189	20	3280	domestic

```
. drop m*
. list
```

	price	weight	foreign
1.	5189	3280	domestic

These changes are only to the data in memory. If you wanted to make the changes permanent, you would need to save the dataset.

keep

keep tells Stata to drop all variables except those specified explicitly or through the use of an **if** or **in** expression. Just like **drop**, **keep** can be used with a *varlist* or with qualifiers, but not with both at once. We use a **clear** command at the start of this example, so that we can reload the **afewcars** dataset.

```
. clear
. use awhilecars
(A few 1978 cars)
. list
```

	make	price	mpg	weight	gear_r~o	foreign
1.	VW Rabbit	4697	25	1930	3.78	foreign
2.	Olds 98	8814	21	4060	2.41	domestic
3.	Chev. Monza	3667	.	2750	2.73	domestic
4.		4099	22	2930	3.58	domestic
5.	Datsun 510	5079	24	2280	3.54	foreign
6.	Buick Regal	5189	20	3280	2.93	domestic
7.	Datsun 810	8129	.	2750	3.55	foreign

```
. keep in 4/7
(3 observations deleted)
. list
```

	make	price	mpg	weight	gear_r~o	foreign
1.		4099	22	2930	3.58	domestic
2.	Datsun 510	5079	24	2280	3.54	foreign
3.	Buick Regal	5189	20	3280	2.93	domestic
4.	Datsun 810	8129	.	2750	3.55	foreign

```
. keep if mpg <= 21
(3 observations deleted)
. list
```

	make	price	mpg	weight	gear_r~o	foreign
1.	Buick Regal	5189	20	3280	2.93	domestic

```
. keep m*
. list
```

	make	mpg
1.	Buick Regal	20

Notes

13 Using the Do-file Editor—automating Stata

The Do-file Editor

Stata comes with an integrated text editor called the Do-file Editor, which can be used for many tasks. It gets its name from the term *do-file*, which is a file containing a list of commands for Stata to run (what is called a batch file in other settings). See [U] [16 Do-files](#) for more information. Although the Do-file Editor has advanced features that can help in writing such files, it can also be used to build up a series of commands that can then be submitted to Stata all at once. This feature can be handy when writing a loop to process multiple variables in a similar fashion or when doing complex repetitive tasks interactively.

To get the most from this chapter, you should work through it at your computer.

The Do-file Editor toolbar

The Do-file Editor has 16 buttons. Many of the buttons have a similar purpose as their look-alikes in the main Stata toolbar.



If you ever forget what a button does, hold the mouse pointer over a button for a moment, and a tooltip will appear with a description of that button.



New: Open a new do-file in the Do-file Editor.



Open: Open a do-file from disk in the Do-file Editor.



Save: Save the current do-file to disk.



Print: Print the contents of the Do-file Editor.



Find: Open the *Find/Replace* dialog for finding and replacing text.



Cut: Cut the selected text and put it in the Clipboard.



Copy: Copy the selected text to the Clipboard.



Paste: Paste the text from the Clipboard into the current document.



Undo: Undo the last change.



Redo: Undo the last undo.



Toggle Bookmark: Turn on/off bookmark on current line. Bookmarks are a way to move quickly within the do-file. They are quite useful in long do-files, or when debugging.



Previous Bookmark: Go to previous bookmark (if any).



Next Bookmark: Go to next bookmark (if any).



Show File in Viewer: Show the contents of the do-file in a Viewer window. This is worthwhile when editing files containing SMCL tags, such as log files or help files.



Execute Quietly (run): Run the commands in the do-file without showing any output. If text is highlighted, the button becomes the **Execute Selection Quietly (run)** button and will run just the selected lines, suppressing all output. This feature is useful when assembling long series of commands. We will refer to this as the **Run** button.



Execute (do): Run the commands in the do-file, showing all commands and their output. If text is highlighted, the button becomes the **Execute Selection (do)** button and will run only the selected lines, showing all output. We will refer to this as the **Do** button.

Using the Do-file Editor

Suppose that we would like to analyze fuel usage for 1978 automobiles similarly to what we did in [GSW] 1 **Introducing Stata—sample session**. We know that we will be issuing many commands to Stata during our analysis and that we want to be able to reproduce our work later without having to type each command again.

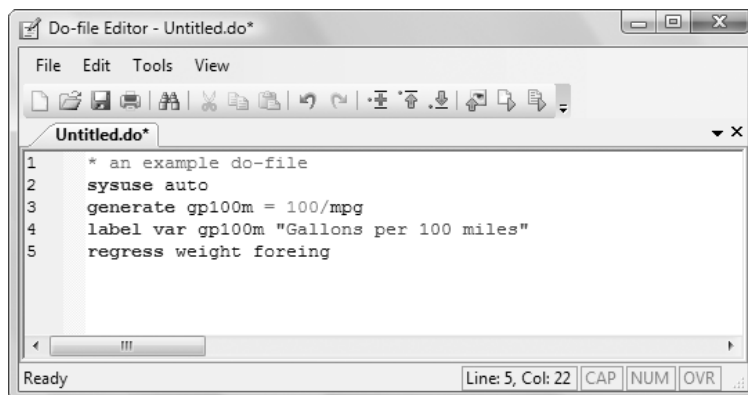
We can do this easily in Stata: simply save a text file containing the commands. When this is done, we can tell Stata to run the file and execute each command in sequence. Such a file is known as a Stata *do-file*; see [U] 16 **Do-files**.

To analyze fuel usage of 1978 automobiles, we would like to create a new variable giving gallons per mile. We would like to see how that variable changes in relation to vehicle weight for both domestic and imported cars. Performing a regression with our new variable would be a good first step.

To get started, click on the **Do-file Editor** button to open the Do-file Editor. After the Do-file Editor opens, type the commands below, because they are what we would like to submit. Purposely misspell the name of the `foreign` variable on the fifth line. (We are intentionally making some common mistakes and then pointing you to the solutions. This will save you time later.)

```
* an example do-file
sysuse auto
generate gpm = 1/mpg
label var gpm "Gallons per mile"
regress gpm weight foreing
```

Here is what your Do-file Editor should look like now:



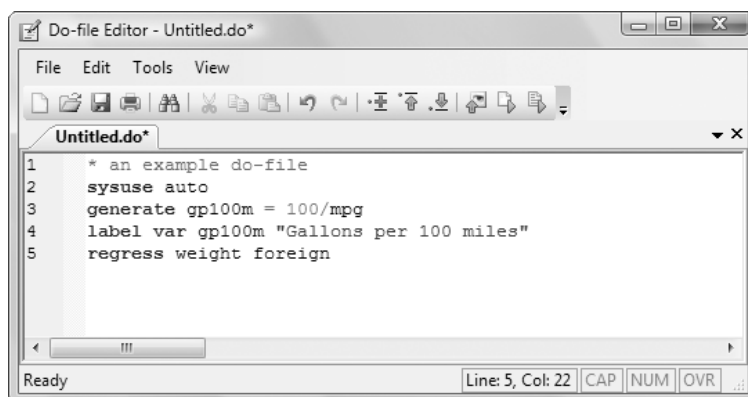
You will notice that the color of the text changes as you type. The different colors are examples of the Do-file Editor's *syntax highlighting*. The colors and text properties of the syntax elements can be changed by selecting **Edit > Preferences...** from the Do-file Editor menu bar, and then clicking on the **Syntax Color** tab in the resulting window. Click on the **Do** button, , to run the commands: When you click on the **Do** button, Stata executes the commands in sequence, and the results appear in the Results window:

```
. do C:\Users\mydir\AppData\Local\Temp\STD08000000.tmp
. * an example do-file
. sysuse auto
(1978 Automobile Data)
. generate gpm = 1/mpg
. label var gpm "Gallons per mile"
. regress gpm weight foreing
variable foreing not found
r(111);
.
end of do-file
```

The `do "C:\ ..."` command is how Stata executes the commands in the Do-file Editor. Stata saves the commands to a temporary file and issues the `do` command to execute them.

(Continued on next page)

Everything worked as planned until Stata saw the misspelled variable. The first three commands were executed, but an error was produced on the fourth. Stata does not know of a variable named `foreign`. We need to go back to the Do-file Editor and correct the mistake:



We click on the Do button again. Alas, Stata now fails on the first line—it will not overwrite the dataset in memory that we had changed.

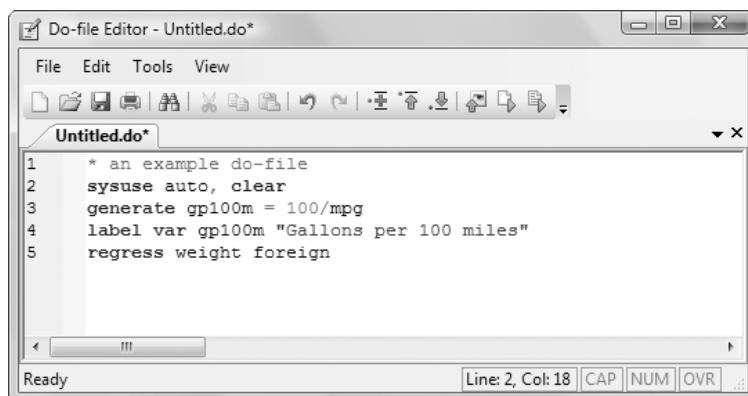
```
. do C:\Users\mydir\AppData\Local\Temp\STD08000000.tmp
. * an example do-file
. sysuse auto
no; data in memory would be lost
r(4);
```

We now have a choice for what we should do:

- We could use our do-file to automatically clear out Stata's memory before it runs. Doing so is convenient, but dangerous, because it defeats Stata's protection against throwing away changes without warning.
- We could manually clear the dataset and then process the do-file again. This process can be aggravating when building a complicated do-file.

Here is some advice: Automatically clear Stata's memory while debugging the do-file. Once the do-file is in its final form, decide the context in which it will be used. If it will be used in a highly automated environment (such as when certifying), the do-file should still automatically clear Stata's memory. If it will be used rarely, do not clear Stata's memory. It will save heartache.

We will add a `clear` option to the `sysuse` command to automatically clear the dataset in Stata's memory before the do-file runs:



The do-file now runs well, as clicking on the Do button shows:

```

. do C:\Users\mydir\AppData\Local\Temp\STD08000000.tmp
. * an example do-file
. sysuse auto, clear
(1978 Automobile Data)
. generate gpm = 1/mpg
. label var gpm "Gallons per mile"
. regress gpm weight foreign

```

Source	SS	df	MS	
Model	.009117618	2	.004558809	
Residual	.00284001	71	.00004	
Total	.011957628	73	.000163803	

				Number of obs =	74
				F(2, 71) =	113.97
				Prob > F =	0.0000
				R-squared =	0.7625
				Adj R-squared =	0.7558
				Root MSE =	.00632

	gpm	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]
weight		.0000163	1.18e-06	13.74	0.000	.0000139 .0000186
foreign		.0062205	.0019974	3.11	0.003	.0022379 .0102032
_cons		-.0007348	.0040199	-0.18	0.855	-.0087504 .0072807

```

.
end of do-file

```

You might want to select **File > Save As...** from the Do-file Editor to save this do-file. Later, you could select **File > Open...** to open it and then add more commands as you move forward with your analysis. By saving the commands of your analysis in a do-file as you go, you do not have to worry about retyping them with each new Stata session. Think hard about removing the `clear` option from the first command.

After you have saved your do-file, you can execute the commands it contains by typing `do filename`, where the *filename* is the name of your do-file.

The File menu

The **File** menu of the Do-file Editor includes standard features found in most text editors. You may choose to start a **New** file, **Open...** an existing file, **Save** the current file, or save the current file under a new name with **Save As...** You may also **Print...** the current file. There are also buttons on the Do-file Editor's toolbar that correspond to these features.

You can also select **File > Insert File...** to insert the contents of another file at the current cursor position in the Do-file Editor.

Editing tools

The **Edit** menu of the Do-file Editor includes the standard **Undo**, **Redo**, **Cut**, **Copy**, **Paste**, and **Delete** capabilities. There are also buttons on the Do-file Editor's toolbar for easy access to these capabilities. There are several other **Edit** menu features that you may find useful:

- **Go To...** will allow you to jump to a specific line number. The line numbers are displayed at the left of the Do-file Editor window.
- **Match Brace** selects the text between a brace, parenthesis, or bracket next to the cursor and its pair.
- **Advanced** leads to a submenu with some programmer's friends:
 - **Shift Right** indents the selection by one tab.
 - **Shift Left** unindents the selection by one tab.
 - **Make Selection Uppercase** converts the selection to all capital letters.
 - **Make Selection Lowercase** converts the selection to all lowercase letters.
 - **View Whitespace** highlights spaces and tab characters.
 - **View End of Lines** displays the character(s) used at the ends of lines.

One other editing tip: You can click on the left margin near a line number to select the entire line and the end-of-line character(s). This makes it easy to delete lines or cut lines and paste them elsewhere. You can click and drag within the line-number column to select a range of complete lines.

Searching

Stata's Do-file Editor includes standard **Find...** and **Replace...** capabilities in the **Edit > Find** menu. You should already be familiar with these capabilities from other text editors and word processors. You may access the **Find** capability from a button on the toolbar as well.

The **Edit > Find** menu also includes some choices that are useful when you are writing a long do-file or ado-file. You may select **Edit > Find > Go to Line...** and jump straight to any line in your file.

Matching and balancing of parentheses (), braces { }, and brackets [] are available from the **Edit > Find** menu. When you select **Edit > Find > Match Brace**, the Do-file Editor looks at the character immediately to the right of the cursor. If it is one of the characters that the editor can match, the editor will find the matching character and place the cursor immediately in front of it. If there is no match, you will hear a beep and the cursor will not move.

The Tools menu

You have already learned about the **Do** button. Selecting **Tools > Execute (do)** is equivalent to clicking on the **Execute (do)** button.

You have also already learned about the **Run** button. Selecting **Tools > Execute Quietly (run)** is equivalent to clicking on the **Execute Quietly (run)** button. Executing quietly still executes all the commands in the Do-file Editor, but does not produce any output. It is unlikely that you will ever need to use the **Run** button; see [U] 16.4.2 [Suppressing output](#) for more details.

Do and **Run** are equivalent to Stata's `do` and `run` commands; see [U] 16 [Do-files](#) for a complete discussion.

If you wish to execute a subset of the lines in your do-file, highlight those lines, and select **Tools > Execute (do)**. If you wish to execute all commands from the current line through the end of the file, select **Tools > Execute (do) to Bottom**.

You can also preview files in the Viewer by selecting **Tools > Show File in Viewer** or by clicking on the **Show File in Viewer** button, . This feature is useful when working with files that use Stata's SMCL tags, such as when writing help files or editing log files.

Saving interactive commands from Stata as a do-file

While working interactively with Stata, you may decide that you would like to rerun the last several commands that you typed interactively. From the Review window, you can send highlighted commands or even the entire contents to the Do-file Editor. You can also save commands as a do-file and open that file in the Do-file Editor. You can copy a command from a dialog (rather than submit it) and paste it into the Do-file Editor. See [GSW] 6 [Using the Data Editor](#) for details. Also see [R] [log](#) for information on the `cmdlog` command, which allows you to log all commands that you type in Stata to a do-file.

Notes

14 Graphing data

Working with graphs

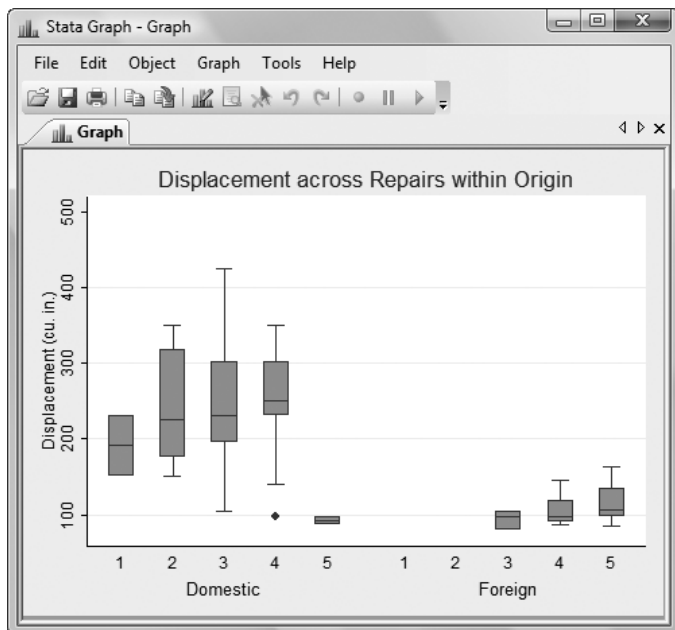
Stata has a rich system for graphical representation of data. The main command for creating graphs is unsurprisingly named `graph`. Behind this plain name is a wealth of tools. In this chapter, we will make one simple graph to point out the basics of the Graph window. See the *Graphics Reference Manual* for more information about all aspects of working with graphs.

A simple graph example

In the sample session of [GSW] 1 [Introducing Stata—sample session](#), we made a scatterplot, added a fitted regression line, and made a grid of scatterplots to allow comparisons across groups. Here we make a simple box plot that shows the displacements of the cars' engines and how they compare across repair records within the place of manufacture of the cars, using the `auto` dataset (`sysuse auto`).

We select **Graphics > Box plot**, choose `displacement` in the *Variables* field on the **Main** tab, click on the **Categories** tab, check the *Group 1* checkbox and enter `rep78` for the first group, and check the *Group 2* checkbox and enter `foreign` for the second group. Finally, we click on the **Submit** button so that we could easily make changes to the graph if need be. After we look at the graph, we realize that we forgot the title. We close the Graph window, click on the **Titles** tab of the *graph box* dialog, add the title *Displacement across Repairs within Origin*, and click on the **Submit** button again.

The Graph window comes up, showing us the fruit of our labor:



Graph window

When the Graph window comes up, it shows our graph in a window with a toolbar. The first four icons are familiar to us from other Stata windows: **Open**, **Save**, **Print**, and **Copy**. The next two icons are new:



Rename Graph: This allows the graph to be renamed. Why would you do this? If you would like to have multiple graphs open at once, the graphs need to be named. So, you can click on the **Rename** button to give a graph a name. This window will then remain open when you create your next graph.



Graph Editor: Stata has a Graph Editor that allows you to manipulate and edit your graph. This feature will be introduced in the next chapter.

The inactive buttons to the right of the **Graph Editor** button are used by the Graph Editor, so their meanings will become clear in the next chapter.

We decide that we like this graph and would like to save it. We can save it either by clicking on the **Save** button and choosing a name and a location or by right-clicking on the Graph window itself, and selecting **Save As...**

Saving and printing graphs

You can save a graph once it is displayed by right-clicking on its window and selecting **Save As...** You can print a graph by right-clicking on its window and selecting **Print...** You can also use the **File** menu to save or print a graph. We recommend that you always right-click on a graph to save or print it to ensure that the correct graph is selected.

Right-clicking on the Graph window

Right-clicking on the Graph window displays a menu from which you can select the following:

- **Save As...** to save the graph to disk.
- **Copy** to copy the graph to the Clipboard.
- **Start Graph Editor** to start the Graph Editor.
- **Preferences...** to edit the preferences for graphs.
- **Print...** to print the contents of the Graph window.

The Graph button

The **Graph** button, , is located on the main window's toolbar. The button has two parts, an icon and an arrow. Clicking on the icon brings the topmost Graph window to the front of all other windows. Clicking on the arrow displays a menu of open graphs. Selecting a graph from the menu brings that graph to the front of all other windows. If you ever decide to close the Graph window, you can reopen it only by reissuing a Stata command that draws a new graph.

15 Editing graphs

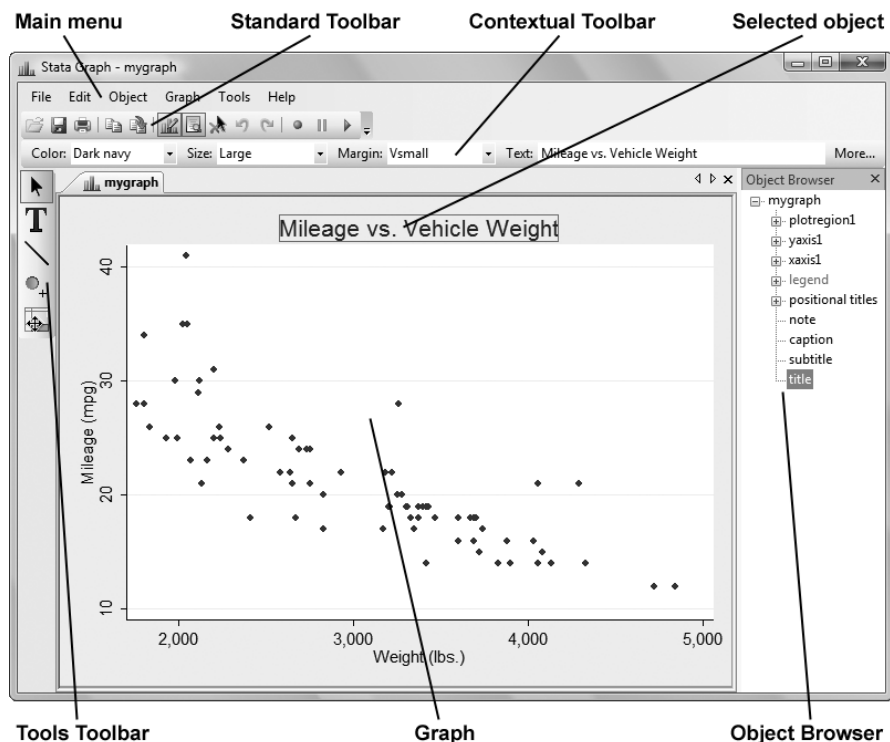
Working with the Graph Editor

With Stata's Graph Editor, you can change almost anything on your graph, and you can add text, lines, arrows, and markers wherever you would like.

We will first make a graph to edit and will then point out the tools in the Graph Editor. Here is the command that we'll use to make the graph:

```
. scatter mpg weight, name(mygraph) title(Mileage vs. Vehicle Weight)
```

Start the Editor by right-clicking on your graph and selecting **Start Graph Editor**. Click once on the title of the graph. Here is a picture of the Graph Editor with its elements labeled.



Select any of the tools along the left of the Editor to edit the graph. The Pointer (Select Tool),



, is selected by default.

You can change the properties of objects or drag them to new locations by using the Pointer. As you select objects with the Pointer, a Contextual Toolbar will appear just above the graph. In our example, the title of the graph is selected, so the Contextual Toolbar has controls that are relevant for editing titles. You can use any of the controls on the Contextual Toolbar to immediately change the

most important properties of the selected object. Right-click on an object to access more properties and operations. Hold the *Shift* key when dragging objects to constrain the movement to horizontal, vertical, or 90-degree angles.

Add text, lines, or markers (with optional labels) to your graph by using the three *Add...* tools—, , and . Lines can be changed to arrows by using the Contextual Toolbar. If you do not like the default properties, simply change their settings in the Contextual Toolbar before adding the text, line, or marker. The new setting will then be applied to all added objects, even in future Stata sessions.

Do not be afraid to try things. If you do not like a result, change it back by using the same tool, or click on the **Undo** button, , in the Standard Toolbar for the Graph Editor (below the main menu). **Edit > Undo** in the main menu does the same thing.

Remember to reselect the Pointer tool when you want to drag objects or change their properties.

You can move objects on the graph and have the rest of the objects adjust their position to accommodate the move with the **Grid Edit** tool, . With this tool, you are repositioning objects in the underlying grid that holds the objects in the graph. Some graphs, e.g., by **graphs**, are composed of nested grids. You can reposition objects only within the grid that contains them; they cannot be moved to other grids.

You can also select objects in the Object Browser along the right of the graph. This window shows a hierarchical listing of the objects in the graph. Clicking or right-clicking on an object in the Object Browser is the same as clicking or right-clicking on the object in the graph.

The Graph Editor has the ability to record your actions and play them back on later graphs. When you click on the **Record** button, , every editing action you take, including undos and redos, is recorded. If you would like to do some editing that is not recorded, you can click on the **Pause** button, . You can click on the **Pause** button again to resume recording. When you are done with your recording, click on the **Record** button. You will be prompted to save your recording. Any recording you save is available from the **Play Recording** button, , and may be applied to future graphs. You can even play a recording in any Stata graph command by using the play option. See [Graph Recorder](#) in [G] [graph editor](#) for more information.

Stop the editor by selecting **File > Stop Graph Editor** from the main menu or by clicking on the **Graph Editor** button. When you stop the Graph Editor, you will be prompted to save your graph if you have made any changes. If you do not save your graph, your changes will not be lost, but you will risk losing them if you create a new graph in the same Graph window. You must stop the Editor if you would like to work on other tasks in Stata.

Here are a few of the things that you can do with the Editor:

- Add annotations using lines, arrows, and text.
- Add or remove grid lines or reference lines.
- Add or modify titles, captions, and notes.
- Change scatterplots to line plots, connected plots, areas, bars, spikes, or drop lines—and, of course, vice versa.
- Change the size, color, margin, and other properties of your graph's titles (or any other text on the graph).
- Move your legend to another side of the graph, or even place it in the plot region.
- Change the aspect ratio of your graph.
- Stack the bars on a bar graph or turn them into percentages.

- Rotate or change the angle of axis labels.
- Add custom ticks and labels to the axes.
- Change the rule for the number and spacing of ticks and labels on an axis.
- Emphasize a point on the graph, whether marker, bar, spike, or other plot, by making it a custom color, size, or symbol.
- Change the text or properties of a marker label.

Because you can edit every property of every object on the graph, you can change almost anything about your graph. To learn more, see [\[G\] graph editor](#) or type `help graph editor`.

Notes

16 Saving and printing results by using logs

Using logs in Stata

When working on an analysis, it is worthwhile to behave like a bench scientist and keep a lab notebook of your actions so that your work can be easily replicated. Everyone has a feeling of complete omniscience while working intensely—this feeling is wonderful but fleeting. The next day, the exact small details needed for perfect duplication have become obscure. Stata has a lab notebook at hand: the *log* file.

A log file is simply a record of your Results window. It records all commands and all textual output as it happens. Thus it keeps your lab notebook for you as you work. Because it writes the file while it writes the Results window, it also protects you from disastrous failures, be they power failures or computer crashes. We recommend that you start a log file whenever you begin any serious work in Stata.

Logging output

All the output that appears in the Results window can be captured in a log file. Stata can save the file in one of two different formats. By default, Stata will save the file in its Stata Markup and Control Language (SMCL) format, which preserves all the formatting and links from the Results window. You can open these results in the Viewer, and they will behave as though they were in the Results window. If you would rather have plain-text files without any formatting, you can save the file as a plain log file. We recommend using the SMCL format, because SMCL files can be translated into a variety of formats readable by applications other than Stata with the **File > Log > Translate...** menu (see [\[R\] translate](#)).

To start a log file, click on the **Log** button, . This will open a standard file dialog that allows you to specify a directory and filename for your log. If you do not specify a file extension, the extension `.smcl` will be added to the filename. If you specify a file that already exists, you will be asked whether you want to append the new log to the file or overwrite the file with the new log.

(Continued on next page)

Here is an example of a short session:

```

name: <unnamed>
log: C:\Users\mydir\Documents\base.smcl
log type: smcl
opened on: 11 May 2009, 22:26:49
. sysuse auto
(1978 Automobile Data)
. by foreign, sort: summarize price mpg

```

```

-> foreign = Domestic

```

Variable	Obs	Mean	Std. Dev.	Min	Max
price	52	6072.423	3097.104	3291	15906
mpg	52	19.82692	4.743297	12	34

```

-> foreign = Foreign

```

Variable	Obs	Mean	Std. Dev.	Min	Max
price	22	6384.682	2621.915	3748	12990
mpg	22	24.77273	6.611187	14	41

```

. * be sure to include the above stats in report!
. * now for something completely different
. corr price mpg
(obs=74)

```

	price	mpg
price	1.0000	
mpg	-0.4686	1.0000

```

. log close
name: <unnamed>
log: C:\Users\mydir\Documents\base.smcl
log type: smcl
closed on: 11 May 2009, 22:26:50

```

There are a few items of interest.

- The header showing the log file's location, type, and starting timestamp is part of the log file. This feature helps when working with multiple log files.
- The two lines starting with asterisks (*) are *comments*. Stata ignores the text following the asterisk, so you may type any comment you would like, with any special characters you would like. Commenting is a good way to document your thought process and to mark sections of the log for later use.
- In this example, the log file was closed using the `log close` command. Doing so is not strictly necessary because log files are automatically closed when you exit Stata.

Stata allows multiple log files to be open at once only if the log files are *named*. For details on this, see `help log`.

Working with logs

Log files are best viewed using Stata's Viewer. Select **File > Log > View...** If there is a log file open (as shown by the status bar), it will be the default log file to view; otherwise, you need to either type the name of the log file into the dialog or click on the **Browse...** button to find the file with a standard file dialog.

Once you are in the Viewer window, everything behaves as expected: you can copy text and paste between the Viewer and anything else that uses text, such as word processors or text editors. You can even paste into the Command window or the Do-file Editor, but you should take care to copy only commands, not their output. It is OK to copy the prompt (“.”) at the start of the echoed command, because Stata is smart enough to ignore it in the Command window. When working with a word processor, what you paste will be unformatted text; it will look best if you use a fixed-width font, like Courier, to display it.

Viewing your current log file is a good way to keep a reminder of something you have already done or a view of a previous result. The Viewer window takes a snapshot of your log file and hence will not scroll as you keep working in Stata. If you need to see more recent results in the Viewer, press the **Refresh** button.

For more detailed information about logs, see [U] [15 Saving and printing output—log files](#) and [R] [log](#). For more information about the Viewer, see [GSW] [3 Using the Viewer](#).

Printing logs

To print a standard SMCL log file, you need to have the log file open in a Viewer window. Once the log file is in the Viewer, you can either right-click on the Viewer window, and select **Print...**, or you can select the Viewer window from **File > Print > “Viewer title”**. A *Print* dialog will appear. After you click on **Print**, an *Output Settings* dialog will appear.

- You can fill in none, any, or all of the items *Header*, *Name*, and *Project*. You can check or uncheck options to *Print Line #s*, *Print Header*, and *Print Logo*. These items are saved and will appear again in the *Print Settings* (in this and in future Stata sessions).
- You can set the margins and color scheme that the printer will use by clicking on **Prefs...** in the *Output Settings* dialog to open the *Printer Preferences* dialog. Monochrome is for black-and-white printing, Color is for default color printing, and Custom 1 and Custom 2 are for customized color printing.
- You can set the font that the printer will use from the *Printer Preferences* dialog. The font dialog will list only the fixed-width “typewriter” fonts (e.g., Courier) available for your printer. Stata, by default, will choose a font size that it thinks is appropriate for your printer.

You could also use the `translate` command to generate a Postscript file. See [R] [translate](#) for more information.

If your log file is a plain-text file (.log instead of .smcl), you can load it into a text editor, such as Notepad, the Do-file Editor in Stata, or your favorite word processor. You can then edit the log file—add headings, comments, etc.—format it, and print it. If you bring the log file into a word processor, it will be displayed and printed with its default font. The log file will not be easily readable when printed in a proportionally spaced font (e.g., Times Roman or Helvetica). It will look much better printed in a fixed-width font (e.g., Courier).

You may wish to associate the .log extension with a text editor (such as Notepad, or WordPad) in Windows. You can then edit and print the logs from those Windows applications if you like.

Rerunning commands as do-files

Stata can also log just the commands from a session without recording the output. This feature is a convenient way to make a do-file interactively. Such a file is called a *cmdlog* file by Stata. You can start a *cmdlog* file by typing

```
cmdlog using filename
```

and you can close the *cmdlog* file by typing

```
cmdlog close
```

Here, for example, is what a *cmdlog* of the previous session would look like. It contains only commands and hence could be used as a do-file.

```
sysuse auto
by foreign, sort: summarize price mpg
* be sure to include the above stats in report!
* now for something completely different
corr price mpg
```

If you start working and then wish you had started a *cmdlog* file, you can save yourself heartache by saving the contents of the Review window. The Review window stores the last 5,000 commands you have typed. Simply right-click on the Review window and select **Save All...** from the menu. If you would like to move the commands directly to the Do-file Editor, select **Send to Do-file Editor**. You may find this method a more convenient way to create a text file containing only the commands that you typed during your session.

See [\[GSW\] 13 Using the Do-file Editor—automating Stata](#), [\[U\] 16 Do-files](#), and [\[U\] 15 Saving and printing output—log files](#) for more information.

17 Setting font and window preferences

Changing and saving fonts and sizes and positions of your windows

You may find that you would like to change the fonts and display style of Stata's windows, depending on your monitor resolution and personal preferences. At the same time, there could be requirements for font usage, say, when you submit graphs to journals. Stata accommodates both of these by allowing sets of preferences for how windows are displayed.

We will first cover what can be changed in each window and then talk about what you can manage with your preferences.

Graph window

The preferences for the Graph window can be changed by right-clicking on the Graph window and choosing **Preferences...** from the contextual menu. The settings can then be set for graphs as they display in Stata. The settings that should be used when printing can be set under the **Printer** tab. The behavior of the clipboard is controlled under the **Clipboard** tab.

The Graph preferences allow various *schemes*. These provide a quick way to optimize graphs for printing or display on a screen. There are even schemes defined for *The Economist* and the *Stata Journal* so that you can get the details for these journals right without much fuss. Changing the scheme *does not* change the current graph—it applies the settings to future graphs.

All other windows

You can change the display font and font size for all other types of windows in Stata.

Fonts and font sizes can be changed for any type of window by right-clicking on the window and selecting **Font...** Doing so will bring up the Font dialog, from which you can pick the font and size of your choice. The font lists for each of the Results, Viewer, Data Editor, and Do-file Editor windows are restricted to fixed-width fonts only. This restriction ensures that output and numbers line up properly and are readable. The Command, Variables, and Review windows can have any font that you would like.

Changing color schemes

The Results and Viewer windows have color schemes that control the way in which input, text, results, errors, links, and highlighted text display. Each has its color scheme set in the same fashion: you can right-click on the window and select or design your own color scheme. The default setting for both the Results window and the Viewer is the built-in *White Background* scheme. There are six other built-in schemes and three settings for custom schemes. The settings for the Viewer affect all Viewer windows at once.

Managing multiple sets of preferences

Stata's preferences are automatically saved when you exit Stata, and they are reloaded when Stata is launched. However, sometimes you may wish to rearrange Stata's windows and then revert the windows to your preferred arrangement. You can do this by saving your preferences to a named preference set and loading them later. Any changes you make to Stata's preferences after loading a preferences set do not affect the set; the set remains untouched unless you specifically overwrite it.

To manage preferences, open the **Edit > Preferences** menu, and do any of the following:

- Select a preference set from the **Load Preference Set** menu to load it.
- Select **Load Preference Set > Factory Settings** to restore the preferences to their factory settings. Other default windowing settings can be found in the **Load Preferences** menu.
- Select **Save Preference Set > New Preferences Set...** to save the current preferences to a set. Enter a name for the set, and click on **OK**.
- Select an existing set from the **Save Preference Set** menu to overwrite it with the current preferences.
- Select a preference set from the **Delete Preference Set** menu to delete it. Click on **OK** to verify that you wish to delete the set.

Closing and opening windows

You can close all windows but the Results and Command windows. If you want to open a closed window, open the **Window** menu and select the desired window.

18 Learning more about Stata

Where to go from here

You now know plenty enough to use Stata. There is still much, much more to learn, because Stata is a rich environment for doing statistical analysis and data management. What should you do to learn more?

- Get an interesting dataset and play with Stata.
 - a. Use the menus and dialog system to experiment with commands. Notice what commands show up in the Results window. You will find that Stata's simple and consistent command syntax will make the commands easy to read so that you will know what you have done, and easy to remember so that typing some commands will be faster than using menus.
 - b. Play with graphs and the Graph Editor.
- If you venture into the Command window, you will find that many things will go faster. You will also find that it is possible to make mistakes where you cannot understand why Stata is balking.
 - a. Try `help commandname` or **Help > Stata Command...** and entering the command name.
 - b. Look at the command syntax, and the examples in the help file, and compare them with what you typed. Compare them closely: small typos make commands impossible for Stata to parse.
- Explore Stata by selecting **Help > Search...** and choosing *Search documentation and FAQs*. You will uncover many statistical routines that could be of great use. Explore beyond this by using the `findit` command.
- Look through the *Combined subject table of contents* in the *Quick Reference and Index*.
- Read and work your way through the *User's Guide*. It is designed to be read cover to cover, and it contains most of the information you need to become an expert Stata user. It is well worth reading.
- Flip through the reference manuals, either paper or PDF, to read about statistical methods you like to use. The reference manuals are not meant to be read cover to cover—they are meant to be referred to like you would an encyclopedia. You can find the datasets used in the examples in the manuals by selecting **File > Example Datasets...**, and then clicking on *Stata 11 manual datasets*. Doing so will enable you to work through the examples quickly.
- Stata has much information, including answers to frequently asked questions (FAQs), at <http://www.stata.com/support/faqs/>.
- There are many useful links to Stata resources at <http://www.stata.com/links/resources.html>. Be sure to look at these materials, as many outstanding resources about Stata are listed here.
- Join *Statalist*, a listserver devoted to discussion of Stata and statistics.
- If you prefer to sample the *User's Guide* and the references, there is some advice later in this chapter for you.
- Subscribe to the *Stata Journal*, which contains reviewed papers, regular columns, book reviews, and other material of interest to researchers applying statistics in a variety of disciplines. Visit <http://www.stata-journal.com>.
- Many supplementary books about Stata are available. Visit the Stata bookstore at <http://www.stata.com/bookstore/>.
- Take a Stata NetCourse™. NetCourse 101 is an excellent choice to learn about Stata. See <http://www.stata.com/netcourse/> for course information and schedules.

- Attend a public training course taught by StataCorp at third-party sites. Visit <http://www.stata.com/training/public.html> for course information and schedules.

Suggested reading from the User's Guide and reference manuals

The *User's Guide* is designed to be read from cover to cover. The reference manuals are designed as references to be sampled when necessary.

Ideally, after reading this *Getting Started* manual, you should read the *User's Guide* from cover to cover, but you probably want to become at least somewhat proficient in Stata right away. Here is a suggested reading list of sections from the *User's Guide* and the reference manuals to help you on your way to becoming a Stata expert.

This list covers fundamental features and points you to some less obvious features that you might otherwise overlook.

Basic elements of Stata

[U] [11 Language syntax](#)

[U] [12 Data](#)

[U] [13 Functions and expressions](#)

Memory

[U] [6 Setting the size of memory](#)

[D] [compress](#) — Compress data in memory

Data input

[U] [6 Setting the size of memory](#)

[U] [21 Inputting data](#)

[D] [infile](#) — Overview of reading data into Stata

[D] [insheet](#) — Read ASCII (text) data created by a spreadsheet

[D] [append](#) — Append datasets

[D] [merge](#) — Merge datasets

Graphics

Graphics Reference Manual

Useful features that you might overlook

[U] [28 Using the Internet to keep up to date](#)

[U] [16 Do-files](#)

[U] [19 Immediate commands](#)

[U] [23 Working with strings](#)

[U] [24 Working with dates and times](#)

[U] [25 Working with categorical data and factor variables](#)

[U] [13.5 Accessing coefficients and standard errors](#)

[U] [13.6 Accessing results from Stata commands](#)

[U] [26 Overview of Stata estimation commands](#)

[U] [20 Estimation and postestimation commands](#)

[R] [estimates](#) — Save and manipulate estimation results

Basic statistics

- [R] **anova** — Analysis of variance and covariance
- [R] **ci** — Confidence intervals for means, proportions, and counts
- [R] **correlate** — Correlations (covariances) of variables or coefficients
- [D] **egen** — Extensions to generate
- [R] **regress** — Linear regression
- [R] **predict** — Obtain predictions, residuals, etc., after estimation
- [R] **regress postestimation** — Postestimation tools for regress
- [R] **test** — Test linear hypotheses after estimation
- [R] **summarize** — Summary statistics
- [R] **table** — Tables of summary statistics
- [R] **tabulate oneway** — One-way tables of frequencies
- [R] **tabulate twoway** — Two-way tables of frequencies
- [R] **ttest** — Mean-comparison tests

Matrices

- [U] **14 Matrix expressions**
 - [U] **18.5 Scalars and matrices**
- Mata Reference Manual*

Programming

- [U] **16 Do-files**
 - [U] **17 Ado-files**
 - [U] **18 Programming Stata**
 - [R] **ml** — Maximum likelihood estimation
- Programming Reference Manual*
Mata Reference Manual

System values

- [R] **set** — Overview of system parameters
- [P] **creturn** — Return c-class values

Internet resources

The Stata web site (<http://www.stata.com>) is a good place to get more information about Stata. Half of the web site is dedicated to user support. You will find answers to FAQs, ways to interact with other users, official Stata updates, and other useful information. You can also subscribe to Statalist, a listserv devoted to discussion of Stata and statistics.

You will also find information on Stata NetCoursesTM, which are interactive courses offered over the Internet that vary in length from a few weeks to 8 weeks. Stata also offers in-person training sessions. Visit the Stata web site for more information.

At the web site is the Stata Bookstore, which contains books that we feel may be of interest to Stata users. Each book has a brief description written by a member of our technical staff explaining why we think this book may be of interest.

We suggest that you take a quick look at the Stata web site now. You can register your copy of Stata online and request a free subscription to the *Stata News*.

Visit <http://www.stata-press.com> for information on books, manuals, and journals published by Stata Press. The datasets used in examples in the Stata manuals are available from the Stata Press web site.

Also visit <http://www.stata-journal.com> to read about the *Stata Journal*, a quarterly publication containing articles about statistics, data analysis, teaching methods, and effective use of Stata's language.

See [GSW] **19 Updating and extending Stata—Internet functionality** for details on accessing official Stata updates and free additions to Stata on the Stata web site.

19 Updating and extending Stata—Internet functionality

Internet functionality in Stata

Stata works well together with the Internet. It can use datasets and view remote help files as though they were on your computer. It can keep itself up to date (with your permission, of course). Finally, you can install *user-written commands*, which are commands that extend Stata’s functionality. These are commands that have been presented in the *Stata Journal* (SJ), the *Stata Technical Bulletin* (STB), or have simply been written and shared by the greater Stata community.

This chapter will show you how you can expand Stata’s horizons.

Using files from the Internet

Stata understands URLs as though they were local file locations. If you know of a file on the web that you would like to use, be it a dataset, a graph, or a do-file, you can open it in Stata easily. Here is a small example.

There are many datasets at <http://www.stata-press.com/data/>. Suppose that you would like to use the `census12` dataset used in [U] 11 Language syntax, and you know that its location is at <http://www.stata-press.com/data/r11/census12.dta>. Because you know that the command for opening a dataset is `use`, you could type the following:

```
. use http://www.stata-press.com/data/r11/census12.dta
(1980 Census data by state)

. describe
Contains data from http://www.stata-press.com/data/r11/census12.dta
  obs:                50                1980 Census data by state
  vars:                 7                6 Apr 2009 15:43
  size:              2,150 (99.9% of memory free)
```

variable name	storage type	display format	value label	variable label
<code>state</code>	str14	%14s		State
<code>state2</code>	str2	%-2s		Two-letter state abbreviation
<code>region</code>	str7	%9s		Census region
<code>pop</code>	long	%10.0g		Population
<code>median_age</code>	float	%9.2f		Median age
<code>marriage_rate</code>	float	%9.0g		
<code>divorce_rate</code>	float	%9.0g		

Sorted by:

This functionality is everywhere in Stata. Any command that reads a file via a *filename* in its syntax can use a web address as easily as a file that is stored on your computer.

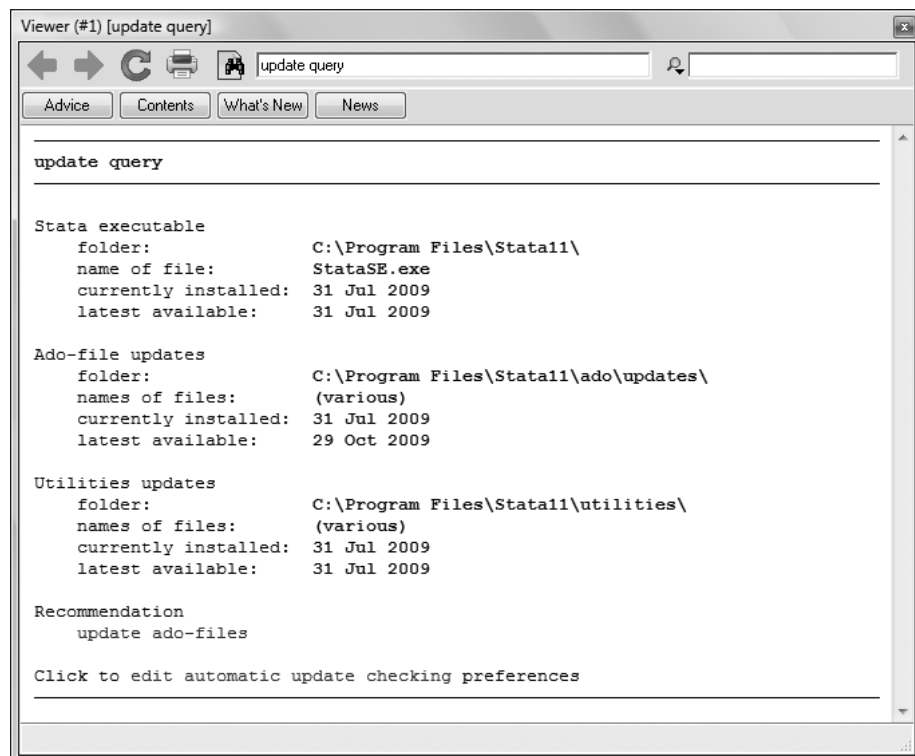
Official Stata updates

By official Stata, we mean the pieces of Stata that are provided and supported by StataCorp. The other and equally important pieces are the user-written additions published in the SJ, distributed over Statalist, or distributed in other ways.

Stata can fetch both official updates and user-written programs from the Internet. Let's start with the official updates. StataCorp often releases updates to official Stata. These updates are to add new features and, sometimes, to fix bugs.

By default, Stata has automatic update checking turned on and set to check for updates every 7 days. We recommend using automatic update checking, because it is a simple, unobtrusive way to be sure that your copy of Stata is always up to date. If you keep this default, you will be prompted with a dialog when you start Stata if you have not checked for updates recently.

When you click on the **OK** button, a Viewer window will open that looks similar to this:



If any of the executable, ado-files, or utilities need updating, you will see a recommendation. Click on the recommendation, and Stata will update whatever needs updating.

If you need to update your executable, there is one final, crucial step: you must install your new executable. Stata makes this easy for you. Exit all instances of Stata that are running except the one in which you ran `update`. Click on the `update swap` link to complete the updating procedure. Stata will exit and start back up again.

You can also check for updates at any time by choosing **Help > Official Updates** and clicking the link to <http://www.stata.com>. Finally, you can also type `update query` in the Command window. Stata will put the update results in the Results window and give you advice for what you should do next.

One troubleshooting note: If you do not have write permission for `C:\Program Files\Stata11`, you cannot install official updates in this way. You may still download the official updates, but you will need to use the command-line version of `update`; see [U] 28 [Using the Internet to keep up to date](#) for instructions.

Automatic update checking

Stata can periodically check for updates for you. By default, Stata will check once every 7 days for updates from Stata's web site. The 7-day interval is from the last time an `update query` was performed regardless of whether it was by Stata or by you. You can change the interval between checks.

Before Stata connects to the Internet to check for an update, it will ask you if you would like to check now, check the next time Stata is launched, or check after the next interval. You can disable the prompt and allow Stata to check without asking.

If an update is available, Stata will notify you. From there, you should follow the recommendations for updating Stata.

You can change the settings for automatic update checking by selecting **Edit > Preferences > General Preferences...** and choosing **Internet**.

Finding user-written programs by keyword

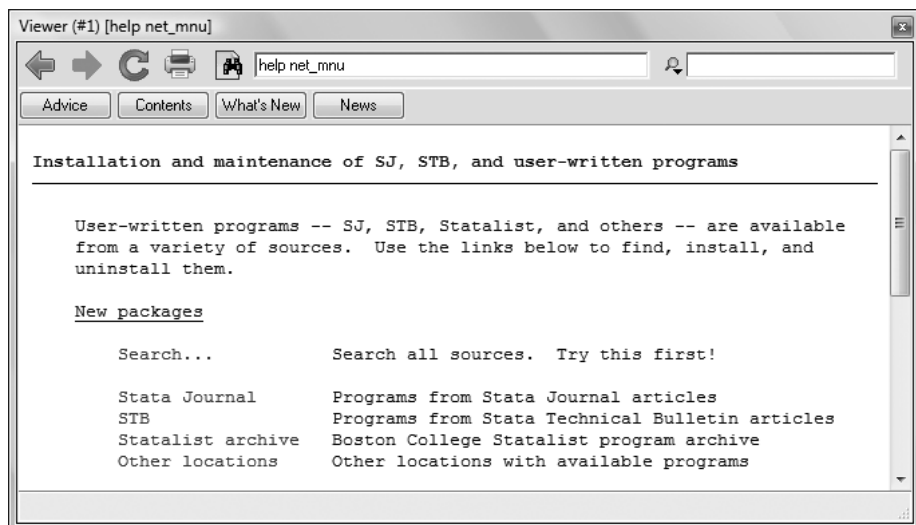
Stata has a built-in utility created specifically to search the Internet for user-written Stata programs. You can access it by selecting **Help > Search...**, choosing *Search net resources*, and entering a keyword in the field. Choosing **Help > SJ and User-written Programs** yields more specific choices for searching. The utility searches all user-written programs on the Internet, including the entire collection of *Stata Journal* and STB programs. The results are displayed in the Viewer, and you can click to go to any of the matches found.

For the syntax on how to use the equivalent `search keywords`, `net` command, see [R] [search](#).

Downloading user-written programs

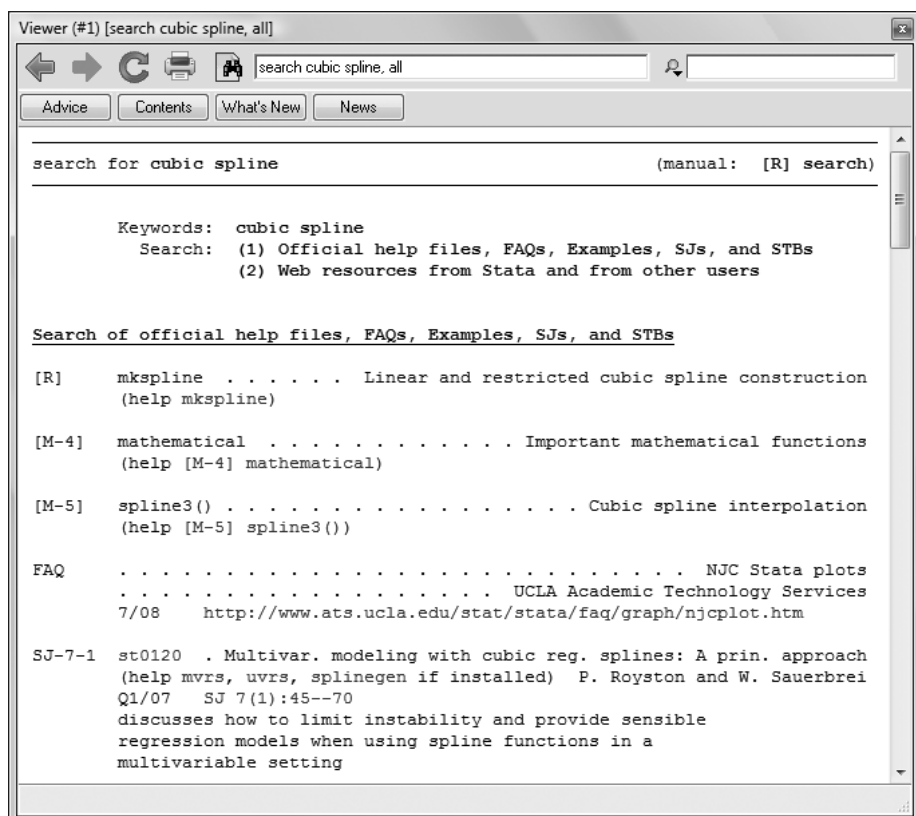
Downloading user-written programs is easy. Start by selecting **Help > SJ and User-written Programs**:

(Continued on next page)

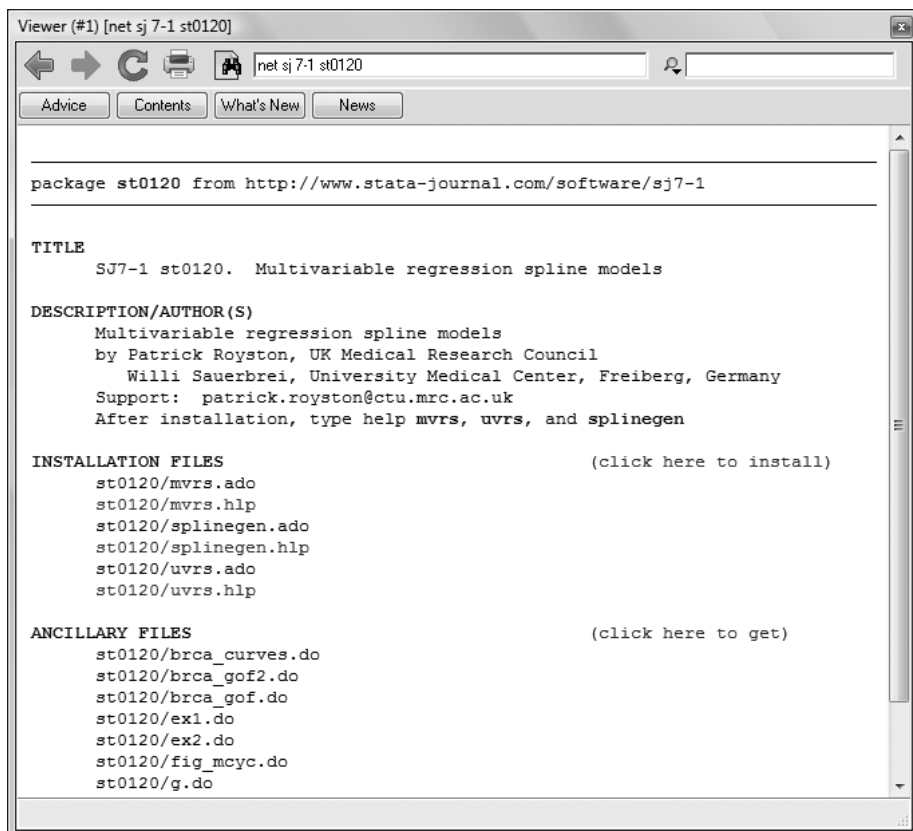


As the Viewer says, try **Search...** first.

Suppose that you were interested in finding more information or some user-written programs involving cubic splines. You select **Help > Search...**, select *Search all*, type cubic spline in the search box, and click on the **OK** button.



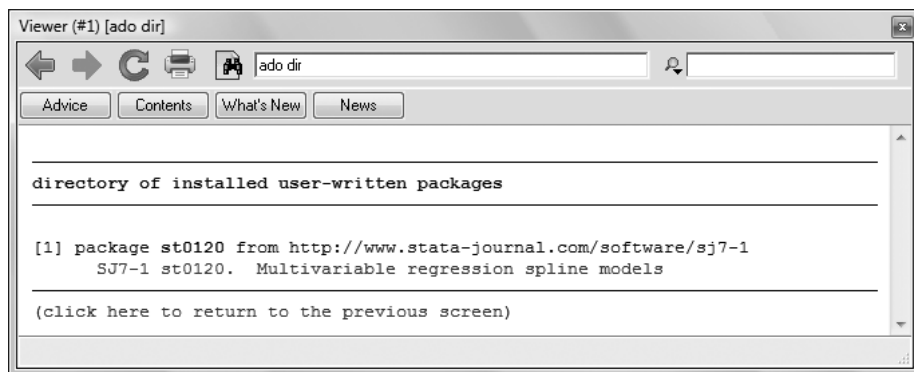
The first entry points to the built-in Stata command `mkspline`. You investigate this and find it interesting. You see that the next two entries point to some built-in routines in Mata. You follow these links, because Mata is not only intriguing but also fast. You see the next link points to an FAQ on Stata's web site. Finally, you decide to check the fifth link. It points to an article in the *Stata Journal*, volume 7, number 1 (first quarter, 2007). You should click on the `st0120` link, because this will go to the programs associated with this article.



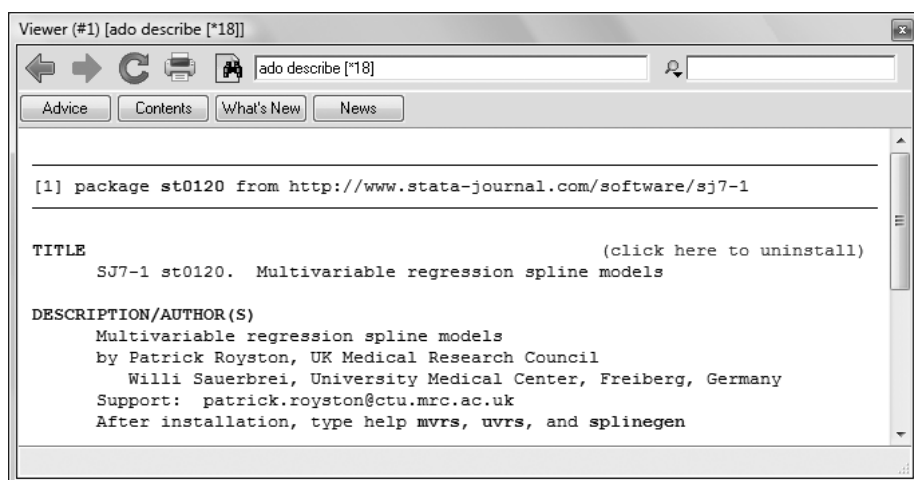
There are many files here! You can click on the help files to see if the commands here look like they are interesting. If you decide that you would like to try the commands, you can click on the link `click here to install`. If you decide that you would like to use some of the ancillary files—files that typically help explain the workings of the command, you could install those, too. You do not need to worry—doing so will not interfere in any way with your copy of Stata. We will show you how to uninstall these programs safely shortly. Click on the install link to install the package. That is all there is to installing a user-written package.

Now suppose that you decide that you would like to uninstall the package. Doing so is simple enough: select **Help > SJ and User-written programs**, and click on the `List` link. You should see the following:

(Continued on next page)



If you click on the one-line description of the program, you will see the full description of what has been installed. Here is a short version of what you would see:



You can uninstall materials by clicking on [click here to uninstall](#) when you are looking at the package description. Try it.

For information on downloading user-written programs by using the `net` command, see [\[R\] net](#).

A Troubleshooting Stata

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A.1 If Stata does not start

You tried to start Stata and it refused; Stata or your operating system presented a message explaining that something is wrong. Here are the possibilities:

Cannot find license file

This message means just what it says; nothing is too seriously wrong. Stata simply could not find what it is looking for. The two most common reasons for this are that you did not complete the installation process or Stata is not installed where it should be.

Did you insert the codes printed on your paper license to unlock Stata? If not, go back and complete the initialization procedure.

Assuming that you did unlock Stata, Stata is merely mislocated, or the location has not been filled in.

Error opening or reading the file

Something is distinctly wrong and for purely technical reasons. Stata found the file that it was looking for, but either the operating system refused to let Stata open it or there was an I/O error.

About the only way this could happen would be a hard-disk error. Stata technical support will be able to help you diagnose the problem; see [\[U\] 3.9 Technical support](#).

License not applicable

Stata has determined that you have a valid Stata license, but the license does not apply to the version of Stata that you are trying to run.

The most common reason for this message is that you have a license for Stata/IC but you are trying to run Stata/SE or Stata/MP, or you have a license for Small Stata but you are trying to run Stata/IC, Stata/SE, or Stata/MP. If this is the case, reinstall Stata, making sure to choose the appropriate flavor.

Other messages

The other messages indicate that Stata thinks you are attempting to do something that you are not licensed to do. Most commonly, you are attempting to run Stata over a network when you do not have a network license, but there are many other alternatives. There are two possibilities: either you really are attempting to do something that you are not licensed to do, or Stata is wrong. In either case, you are going to have to contact us. Your license can be upgraded, or, if Stata is wrong, we can provide codes to make Stata stop thinking that you are violating the license; see [\[U\] 3.9 Technical support](#).

A.2 Troubleshooting tips

If you experience an unexpected problem, first make sure that you are running the most current version of Stata (see [GSW] 19 **Updating and extending Stata—Internet functionality** for information on updating). If the problem still exists, look at the frequently asked questions (FAQs) for Windows in the user-support section of the Stata web site, <http://www.stata.com>. You may find the answer to the problem there. If not, we can help, but you must give us as much information as possible.

Reboot your computer, restart Stata, and try to reproduce the problem, writing down everything you do before the fault occurs. We will want that information.

If Stata used to work on your computer but suddenly stopped working, try to remember any hardware or software that you have recently installed.

Also give us as much information about your computer as possible. What version of Windows are you running? How much memory do you have? What processor do you have? What brand is your computer? What kind of mouse do you have? What kind of video card? Finally, we need your Stata serial number and the date your version of Stata was “born”. Include them if you email, and know them if you call. You can obtain them by typing `about` in Stata’s Command window. `about` lets us know everything about your copy of Stata, including the version and the date it was produced.

B Managing memory

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B.1 Memory size considerations

Stata works with a copy of the dataset that it loads into memory.

By default, Small Stata allocates enough memory for 99 variables and 1200 observations; you cannot change it.

By default, Stata/IC allocates 10 MB to Stata's data areas, and you can change it.

By default, Stata/MP and Stata/SE allocate 50 MB to Stata's data areas, and you can change it.

You can even change the allocation to be larger than the physical amount of memory on your computer because Windows provides virtual memory.

Virtual memory is slow but adequate in rare cases when you have a dataset that is too large to load into real memory. If you use large datasets often, we recommend that you add more memory to your computer. See [GSW] [B.4 Virtual memory and speed considerations](#).

You can change the allocation when you start Stata, as will be discussed in [GSW] [C.4 Specifying the amount of memory allocated](#).

You can also change the total amount of memory allocated while Stata is running and optionally make that setting the default to be used by future invocations of Stata. That is the topic of this appendix.

It does not much matter which method you use. Being able to change the total on the fly is convenient, but even if you cannot do this, it just means that you must specify it ahead of time, and if later you need more, you must exit Stata and reinvoke it with the larger total.

Do not specify more memory than you actually need. Doing so does not benefit Stata; in fact, it may slow Stata down!

B.2 Setting the size on the fly

Assume that you have changed nothing about how Stata starts, so you have the default amount of memory (50 MB for Stata/MP and Stata/SE, 10 MB for Stata/IC) allocated to Stata's data areas. You are working with a large dataset and now wish to increase memory to 100 MB. You can type

```
. set memory 100m
```

and, if your operating system can provide the memory to Stata, Stata will work with the new total. Later in the session, if you want to release that memory and work with only 2 MB, you could type

```
. set memory 2m
```

There is only one restriction on the `set memory` command: whenever you change the total, there cannot be any data already in memory. If you have a dataset in memory, you save it, clear memory, reset the total, and then use it again. We are getting ahead of ourselves, but you might type

```
. save mydata, replace
file mydata.dta saved

. clear

. set memory 100m
...

. use mydata
```

When you request the new allocation, your operating system might refuse to provide it:

```
. set memory 1800m
op. sys. refuses to provide memory
r(909);
```

If that happens, you are going to have to take the matter up with your operating system. In the above example, Stata asked for 1800 MB, and the operating system said no.

B.3 The memory command

`memory` helps you figure out whether you have enough memory to do something. If you are using Stata/SE (or Stata/MP), you could type `memory`:

```
. memory
```

	bytes	
Details of set memory usage		
overhead (pointers)	114,136	10.88%
data	913,088	87.08%
data + overhead	1,027,224	97.96%
free	21,344	2.04%
Total allocated	1,048,568	100.00%
Other memory usage		
set maxvar usage	1,816,666	
set matsize usage	1,315,200	
programs, saved results, etc.	772	
Total	3,132,638	
Grand total	4,181,206	

You can type `memory` in Stata/IC, too, but the output will vary slightly from that of Stata/SE and Stata/MP; see [\[D\] memory](#). Having 21,344 bytes free is not much. You might increase the amount of memory allocated to Stata’s data areas by specifying `set memory 2m`.

```
. save nlswork
. clear
. set memory 2m
...

. use nlswork
(National Longitudinal Survey. Young Women 14-26 years of age in 1968)
```

. memory		
	bytes	
Details of set memory usage		
overhead (pointers)	114,136	5.44%
data	913,088	43.54%
data + overhead	1,027,224	48.98%
free	1,069,920	51.02%
Total allocated	2,097,144	100.00%
Other memory usage		
set maxvar usage	1,816,666	
set matsize usage	1,315,200	
programs, saved results, etc.	773	
Total	3,132,639	
Grand total	5,229,783	

More than 1 MB is now free; that's better. See [D] [memory](#) for more information.

You can use **set memory** to set the memory for future Stata sessions, as well as the current session, by using the **permanently** option. If, for example, you wanted 100 MB of memory allocated for data in future Stata sessions, you could type

```
. set memory 100m, permanently
```

B.4 Virtual memory and speed considerations

When you open (use) a dataset in Stata for Windows, Stata loads the entire dataset into memory.

When you use more memory than is physically available on your computer, Stata slows down. If you are using only a little more memory than is on your computer, performance is probably not too bad. On the other hand, when you are using a lot more memory than is on your computer, performance will be noticeably affected. We recommend then that you type

```
. set virtual on
```

Virtual memory systems exploit locality of reference, which means that keeping objects closer together allows virtual memory systems to run faster. **set virtual** controls whether Stata should perform extra work to arrange its memory to keep objects close together. By default, **virtual** is set **off**. **set virtual** can be specified only if you are using Stata/MP, Stata/SE, or Stata/IC.

In general, you want to leave **set virtual** set to the default of **off** so that Stata will run faster.

When you **set virtual on**, you are asking Stata to arrange its memory so that objects are kept closer together. This setting requires Stata to do a substantial amount of work. We recommend setting **virtual on** only when the amount of memory in use drastically exceeds what is physically available. In these cases, setting **virtual on** will help, but keep in mind that performance will still be slow. See [U] [6.5 Virtual memory and speed considerations](#). If you are using virtual memory often, you should consider adding memory to your computer.

Notes

C Advanced Stata usage

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C.1 The Windows Properties Sheet

When you double-click on a shortcut to start an application in Windows, you are actually executing instructions defined in the shortcut’s Properties Sheet. To open the Properties Sheet for any shortcut, right-click on the shortcut, and select **Properties**.

Open the Properties Sheet for Stata’s shortcut. Click on the **Shortcut** tab. You will see something like the following:

Stata/SE	
Target type:	Application
Target location:	Stata 11
Target:	C:\Program Files\Stata11\StataSE.exe
Start in:	C:\Users\mydir\Documents\
Shortcut key:	None
Run:	Normal window

The field names may be slightly different, depending on the version of Windows that you are running. The names and locations of files may vary from this. There are two things to pay attention to: the *Target* and *Start in* fields. *Target* is the actual command that is executed to invoke Stata. *Start in* is the directory to switch to before invoking the application. You can change these fields and then click on **OK** to save the updated Properties Sheet.

You can have Stata start in any directory you desire. Just change the *Start in* field of Stata’s Properties Sheet. Of course, once Stata is running, you can change directories whenever you wish; see [D] **cd**.

C.2 Making shortcuts

You can arrange to start Stata without going through the **Start** menu by creating a shortcut on the Desktop. The easiest way to do this is to copy the existing Stata shortcut to the Desktop. You can also create a shortcut directly from the Stata executable. Here are the details:

1. Open the C:\Program Files\Stata11 folder or the folder where you installed Stata.

2. In the folder, find the executable for which you want a new shortcut. The filenames for Stata are

	32-bit	64-bit	Itanium
Stata/MP:	StataMP.exe	StataMP-64.exe	StataMP-ia.exe
Stata/SE:	StataSE.exe	StataSE-64.exe	StataSE-ia.exe
Stata/IC:	Stata.exe	Stata-64.exe	Stata-ia.exe
Small Stata:	smStata.exe	(n/a)	(n/a)

Right-click on and drag the appropriate executable onto the Desktop.

3. Release the mouse button, and select **Create Shortcut(s) Here** from the menu that appears.

You have now created a shortcut. If you want the shortcut in a folder rather than on the Desktop, you can drag it into whatever folder appeals to you.

You set the properties for this shortcut just as you would normally. Right-click on the shortcut, and select **Properties**. Edit the Properties Sheet as explained above in [GSW] C.1 The Windows Properties Sheet. Some users create separate shortcuts for starting Stata with different amounts of memory.

C.3 Executing commands every time Stata is started

Stata looks for the file `profile.do` when it is invoked and, if it finds it, executes the commands in it. Stata looks for `profile.do` first in the directory where Stata is installed, then in the current directory, then along your path, then in your home directory as defined by Windows' `USERPROFILE` environment variable, and finally along the `ado-path` (see [P] `sysdir`); we recommend that you put `profile.do` in the default working directory which you set when you installed Stata. If you are not sure what your default working directory is, type `pwd` in the Command window immediately after starting Stata.

Say that every time you start Stata you want `matsize` set to 800 (see [R] `matsize`). Create the file `profile.do` in your default working directory, say `C:\Users\mydir\Documents`, containing

```
set matsize 800
```

When you invoke Stata, this command will be executed:

```
(usual opening appears, but with the addition)
running C:\Users\mydir\Documents\profile.do ...
. _
```

You could also type `set matsize 800`, permanently in Stata. The `permanently` option tells Stata to remember the setting for future sessions and eliminates the need to put the `set matsize` command in `profile.do`.

`profile.do` is treated just as any other do-file once it is executed; results are just the same as if you had started Stata and then typed `run profile.do`. The only special thing about `profile.do` is that Stata looks for it and runs it automatically.

System administrators may also find `sysprofile.do` useful. This file is handled in the same way as `profile.do`, except that Stata looks for `sysprofile.do` first. If that file is found, Stata will execute any commands it contains. After that, Stata will look for `profile.do` and, if that file is found, execute the commands in it.

One example of how `sysprofile.do` might be useful is for system administrators who want to change the path to one of Stata's system directories. Here `sysprofile.do` could be created to contain the command

```
sysdir set SITE "\\Matador\StataFiles"
```

See [U] **16 Do-files** for an explanation of do-files. They are nothing more than ASCII text files containing a sequence of commands for Stata to execute.

C.4 Specifying the amount of memory allocated

Only users of Stata/MP, Stata/SE, and Stata/IC may change the amount of memory Stata allocates.

You can change the amount of memory once Stata is running by using the `set memory` command, and you can make that setting permanent; see [GSW] **B Managing memory**.

C.5 Launching Stata by double-clicking on a Stata file

The first time that you start Stata for Windows, Stata registers with Windows the actions to perform when you double-click on certain types of files. You can then start Stata by double-clicking on a Stata `.dta` dataset, a Stata `.do` do-file, or a Stata `.gph` graph file. In all cases, your current working directory will become the folder containing the file you have double-clicked.

Stata will behave as you would expect in each case. If you double-click on a dataset, Stata will open the dataset after it starts. If you double-click on a do-file, the do-file will be run by Stata. If you double-click on a graph, the graph will be opened by Stata.

When you right-click on a Stata `.gph` file, you can select **Print** or **Print to default**. If you select **Print**, Stata launches, displays the graph, and opens a print dialog. If you select **Print to default**, Stata launches and prints the graph to the default printer, bypassing the print dialog. When the graph is finished printing (or when you cancel the print), Stata exits.

C.6 Stata batch mode

You can run large jobs in Stata in batch mode. There are a few different ways to do this, depending on what your goals are.

Method 1

If you have a particular location where your log file should be after the job is done, this is the method you should use.

Click on the **Start** menu and choose **Run....** If you are working on Windows 7 or Windows Vista and do not see the **Run...** button, then you need to click on **Start > All Programs > Accessories > Run**. In the *Open* field, type

```
cmd
```

and press *Enter*. This will open a command prompt. Change the current directory to the place you would like the log file to be by using the `cd` command. For example, suppose your `bigjob` do-file is in `C:\Users\someone\statastuff`, and you would like to save your log in `C:\Users\someone\statalogs`. You would type the following to suppress all screen output and place the log file in the proper location:

```
cd C:\Users\someone\statalogs
"C:\Program Files\Stata11\StataSE.exe" /e do "C:\Users\someone\statastuff\bigjob"
```

You must specify the location of the Stata executable.

Method 2

If you don't really care where the log file should be after your job is done, and you are allowed to write to the directory where Stata is installed, then use the same method as above, but skip the `cd` step.

Method 3

If you would like to have a batch job that you could run at a particular time or that you could save for later use, you can use the Task Scheduler, which is part of most Windows installations.

This is a bit more advanced, and its implementation differs slightly for each kind of Windows, but here is the general gist.

You can usually find the Task Scheduler by clicking **Start > Programs > Accessories > System Tools > Task Scheduler**. Once you have opened the Task Scheduler, click on **Create Basic Task** and follow the steps of the Basic Task Schedule Wizard to schedule a do-file to run in batch mode (must specify the `/b` or `/e` option). In the *Start in* field, type the path where you would like the log file to be saved. When this file runs, all output will be suppressed and written to a log file that will be saved in the path specified.

General notes

If the do-file loads datasets that require more than the default amount of memory (50 MB for Stata/MP and Stata/SE, 10 MB for Stata/IC), you will need to allocate this to Stata when you start it. If, for example, you wanted to allocate 15 MB of memory, you would include an `/m15` option. Of course, your do-file could also try to change the memory allocated to Stata while it is running with the `set memory` command; see [\[GSW\] B Managing memory](#).

While your do-file is executing, the Stata icon will appear on the taskbar together with a rough percentage of how much of the do-file Stata has executed. (Stata calculates this percentage from the number of characters in the do-file, so the percentage may not accurately reflect the amount of time left for the job to complete.)

If you click on the icon on the taskbar, Stata will display a box asking if you want to cancel the batch job.

Once the do-file is complete, Stata will flash the icon on the taskbar on and off. You can then click on the icon to close Stata. If you wish for Stata to automatically exit after running the batch do-file, use `/e` rather than `/b`.

You do not have to run large do-files in batch mode. Any do-file that you run in batch mode can also be run interactively. Simply start Stata, type `log using filename`, and type `do filename`. You can then watch the do-file run, or you can minimize Stata while the do-file is running.

C.7 Running simultaneous Stata sessions

Each time you double-click on the Stata icon or launch Stata in any other way, you invoke a new instance of Stata, so if you want to run multiple Stata sessions simultaneously, you may. The title bar of each new Stata that is invoked will reflect its instance number.

D More on Stata for Windows

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D.1 Using Stata datasets and graphs created on other platforms

Stata will open any Stata `.dta` dataset or `.gph` graph file regardless of the platform on which it was created, even if it was a Mac or Unix system. Also, Stata for Mac and Stata for Unix users can use any files that you create. If you transfer a Stata file by using file transfer protocol (FTP), just remember to transfer using binary mode rather than ASCII.

D.2 Exporting a Stata graph to another document

Suppose that you wish to export a Stata graph to a document created by your favorite word processor or desktop publishing (DTP) application. You have two main choices for exporting graphs: you may copy and paste the graph by using the Clipboard, or you may save the graph in one of several formats and import the graph into the application.

D.2.1 Exporting the graph by using the Clipboard

The easiest way to export a Stata graph into another application is via the Clipboard.

Either create your graph or redisplay an existing graph. To copy it to the Clipboard, right-click on the Graph window, and select **Copy**. Stata will copy the graph as an Enhanced Metafile (EMF); this ensures that the receiving application obtains it in the highest resolution possible. If the receiving application does not understand the EMF format, select **Edit > Preferences > Graph Preferences**, click on the **Clipboard** tab, and click the *Windows Metafile (WMF)* radio button to copy graphs in the Windows Metafile (WMF) format before copying.

A metafile contains the commands necessary to redraw the graph. That is, a metafile is a collection of lines, points, text, and color information. Metafiles, therefore, can be edited in a structured drawing program.

After you have copied the graph to the Clipboard, switch to the application into which you wish to import the graph and paste it. In most applications, this is accomplished by selecting **Edit > Paste**. Consult the documentation for your particular application for more details.

(Continued on next page)

D.2.2 Exporting the graph to a file

Stata can export graphs to several different file formats. If you right-click on a graph, select **Save As...**, and then click the *Save as type* combobox, you will see that Stata can save in Windows Metafile, Enhanced Metafile, Portable Network Graphics (PNG), TIFF, PostScript, Enhanced PostScript (EPS), and EPS with TIFF preview. Windows Metafile, Enhanced Metafile, PostScript, and EPS formats are vector formats, whereas PNG and TIFF are bitmap formats. EPS files are recommended when you want to export your graph to an application on another platform, such as $\text{T}_{\text{E}}\text{X}$ or $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$ on Unix (which is how all the graphs in Stata's manuals were created), or for best output on a PostScript printer. If you wish to include a preview of the graph so that it may be viewed in your DTP application, choose **EPS with TIFF preview**. Choosing the preview option does not affect how the graph is printed. PNG is well suited for placing graphs on a web page. See the *Graphics Reference Manual* for more information.

D.3 Installing Stata for Windows on a network drive

You will need a network license before you can install Stata on a network drive. You can install Stata from the server, or if you have the appropriate privileges, you can install Stata directly to the network drive.

Once Stata is installed, run it to initialize the license. Mount the network drive that Stata is installed on from a workstation. Right-click on the Desktop or on the Windows **Start** menu, and select **New > Shortcut**. Type the path for the Stata executable into the edit field, or click on **Browse...** to locate it. Enter Stata for the name of the shortcut.

Once a shortcut for Stata has been created, right-click on it, and select **Properties**. Set the default working directory for Stata by changing the *Start in* field to a local drive that users have write access to. This is where Stata will store datasets, graphs, and other Stata-related files. If the workstation will be used by more than one user, consider changing the *Start in* field to the environment variable `%HOMEDRIVE%\%HOMEPATH%`. Doing so will set the default working directory to each user's home directory.

D.4 Changing a Stata for Windows license

If you have already installed Stata and your license needs to be changed, follow these steps:

1. You will need the *License and Authorization Key*.
2. Open the Stata directory from the hard drive.
3. Right-click on the `STATA.LIC` file, and select **Rename**.
4. Change the name of the file to `STATA.LIC.old`.
5. Run Stata, which will then prompt you for your license information and recreate the `STATA.LIC` file.
6. Run Stata as an unprivileged user to ensure that it runs correctly. If Stata runs for the privileged user but does not run for the unprivileged user, check the permissions on the `STATA.LIC` file.
7. Once Stata runs properly with the new license information, delete the file `STATA.LIC.old`.

Subject index

This is the subject index for the *Getting Started with Stata for Windows* manual. Readers may also want to consult the [combined subject index](#) (and the [combined author index](#)) in the *Quick Reference and Index*. The combined index indexes the *Getting Started* manuals, the *User's Guide*, and all the reference manuals except the *Mata Reference Manual*.

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