2 A brief description of Stata

Stata is a statistical package for managing, analyzing, and graphing data.

Stata is available for a variety of platforms. Stata may be used either as a point-and-click application or as a command-driven package.

Stata's GUI provides an easy interface for those new to Stata and for experienced Stata users who wish to execute a command that they seldom use.

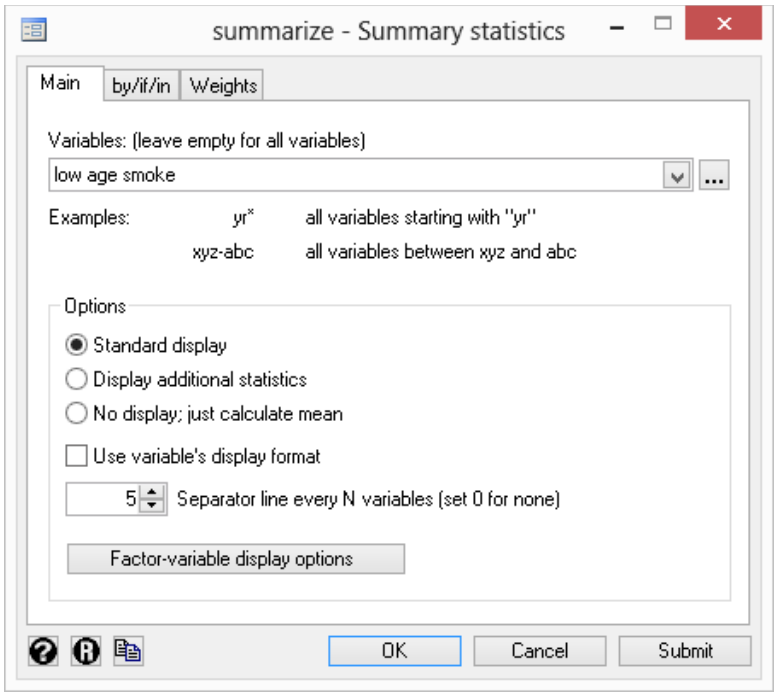
The command language provides a fast way to communicate with Stata and to communicate more complex ideas.

Here is an extract of a Stata session using the GUI:

(Throughout the Stata manuals, we will refer to various datasets. These datasets are all available from http://www.stata-press.com/data/r15/. For easy access to them within Stata, type `webuse` *dataset_name*, or select **File > Example datasets...** and click on *Stata 15 manual datasets*.)

```
. webuse lbw
(Hosmer & Lemeshow data)
```

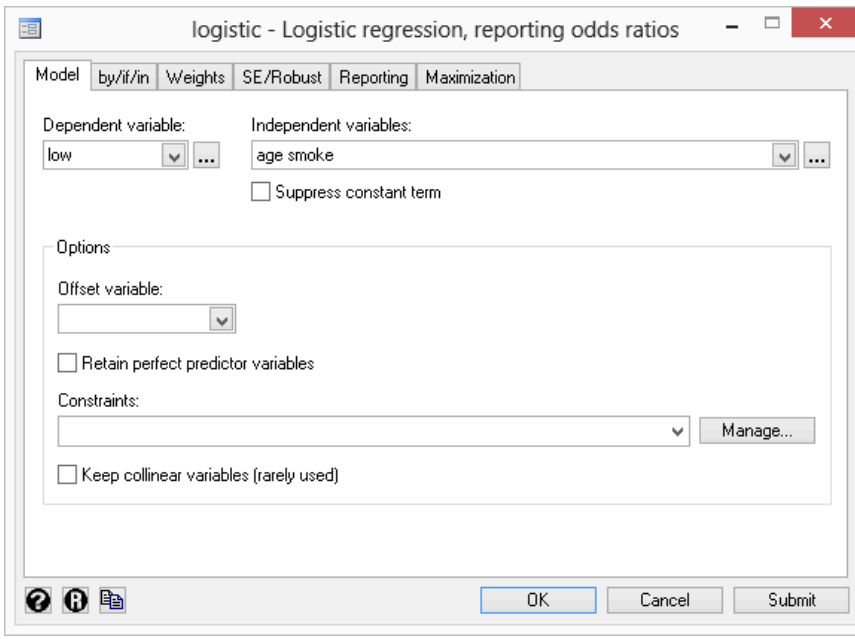
We select **Data > Describe data > Summary statistics** and choose to summarize variables `low`, `age`, and `smoke`, whose names we obtained from the Variables window. We click on **OK**.



```
. summarize low age smoke
    Variable |        Obs        Mean    Std. Dev.       Min        Max
-------------+---------------------------------------------------------
         low |        189   .3121693   .4646093          0          1
         age |        189    23.2381    5.298678         14         45
       smoke |        189   .3915344   .4893898          0          1
```

Stata shows us the command that we could have typed in command mode—`summarize low age smoke`—before displaying the results of our request.

Next we fit a logistic regression model of `low` on `age` and `smoke`. We select **Statistics > Binary outcomes > Logistic regression**, fill in the fields, and click on **OK**.




```
. logistic low age smoke
Logistic regression                             Number of obs     =        189
                                                LR chi2(2)        =       7.40
                                                Prob > chi2       =     0.0248
Log likelihood = -113.63815                     Pseudo R2         =     0.0315

------------------------------------------------------------------------------
         low | Odds Ratio   Std. Err.      z    P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
         age |   .9514394   .0304194    -1.56   0.119     .8936482    1.012968
       smoke |   1.997405    .642777     2.15   0.032     1.063027    3.753081
       _cons |   1.062798   .8048781     0.08   0.936     .2408901    4.689025
------------------------------------------------------------------------------
Note: _cons estimates baseline odds.
```

Here is an extract of a Stata session using the command language:

```
. use http://www.stata-press.com/data/r15/auto
(1978 Automobile Data)

. summarize mpg weight
```

Variable	Obs	Mean	Std. Dev.	Min	Max
mpg	74	21.2973	5.785503	12	41
weight	74	3019.459	777.1936	1760	4840

The user typed `summarize mpg weight` and Stata responded with a table of summary statistics. Other commands would produce different results:

```
. generate gp100m = 100/mpg

. label var gp100m "Gallons per 100 miles"

. format gp100m %5.2f

. correlate gp100m weight
(obs=74)
```

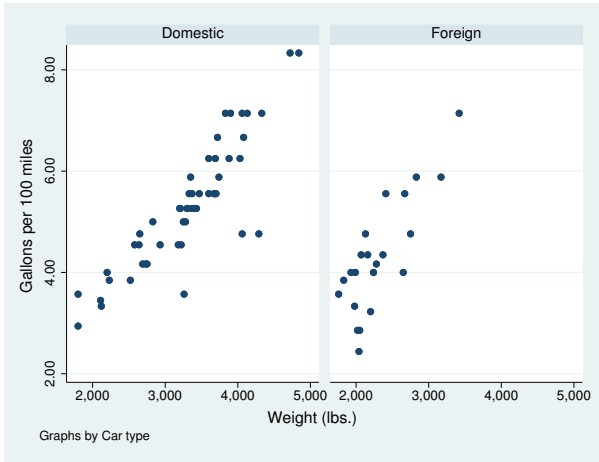
	gp100m	weight
gp100m	1.0000	
weight	0.8544	1.0000

```
. regress gp100m weight gear_ratio
```

Source	SS	df	MS		
Model	87.4543721	2	43.7271861	Number of obs	= 74
Residual	32.1218886	71	.452420967	F(2, 71)	= 96.65
				Prob > F	= 0.0000
				R-squared	= 0.7314
				Adj R-squared	= 0.7238
Total	119.576261	73	1.63803097	Root MSE	= .67262

gp100m	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
weight	.0014769	.0001556	9.49	0.000	.0011665	.0017872
gear_ratio	.1566091	.2651131	0.59	0.557	-.3720115	.6852297
_cons	.0878243	1.198434	0.07	0.942	-2.301786	2.477435

```
. scatter gp100m weight, by(foreign)
```



The user-interface model is type a little, get a little, etc., so that the user is always in control.

Stata's model for a dataset is that of a table—the rows are the observations and the columns are the variables:

```
. list mpg weight gp100m in 1/10
```

	mpg	weight	gp100m
1.	22	2,930	4.55
2.	17	3,350	5.88
3.	22	2,640	4.55
4.	20	3,250	5.00
5.	15	4,080	6.67
6.	18	3,670	5.56
7.	26	2,230	3.85
8.	20	3,280	5.00
9.	16	3,880	6.25
10.	19	3,400	5.26

Observations are numbered; variables are named.

Stata is fast. That speed is due partly to careful programming, and partly because Stata keeps the data in memory. Stata's file model is that of a word processor: a dataset may exist on disk, but the dataset in memory is a copy. Datasets are loaded into memory, where they are worked on, analyzed, changed, and then perhaps stored back on disk.

Working on a copy of the data in memory makes Stata safe for interactive use. The only way to harm the permanent copy of your data on disk is if you explicitly save over it.

Having the data in memory means that the dataset size is limited by the amount of computer memory. Stata stores the data in memory in an efficient format—you will be surprised how much data can fit. Nevertheless, if you work with extremely large datasets, you may run into memory constraints. You will want to learn how to store your data as efficiently as possible; see [D] **compress**.