

Introduction to Stata

Iowa Social Research Center (ISRC) Workshop

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PC

The screenshot shows the Stata software interface. The main window displays the following content:

Command Window:

```

use "D:\data\stata\data\cars.dta"
clear
log using commandwindow, replace
use "D:\data\stata\data\cars.dta"
log close
clear
regress mpg weight horsepower

```

Output:

```

Source          |SS       |df|    Mean Square    |Pr > F      |[95% Conf. Interval]
-----+-----+---+-----+-----+-----
Model          | 87.2564000 | 2 | 43.6282000 | 0.0000     | 43.6282000 43.6282000
Residual       | 32.2797620 | 78 | .413840667 | 0.9999     | .413840667 .413840667
Total          | 119.5361620 | 80 |              |            |             

```

Variables:

Name	Label
mpg	Miles per gallon
weight	Weight in pounds
horsepower	Horsepower in horsepower
year	Year
displacement	Displacement in cubic inches
year1970	Year 1970
foreign	Foreign

Properties:

Model:

Variable	Label
weight	Weight in pounds
horsepower	Horsepower in horsepower
year	Year
displacement	Displacement in cubic inches
year1970	Year 1970
foreign	Foreign

Results:

Variable	Label
weight	Weight in pounds
horsepower	Horsepower in horsepower
year	Year
displacement	Displacement in cubic inches
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Command Window:

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MAC



Descriptions

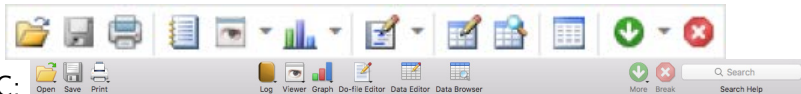
- ❶ Command – Type commands
- ❷ Results – Executed commands and resulting output
 - ❶ Current and Command log status
- ❸ Review – Past commands from current session
- ❹ Variables – Variable list of current dataset
- ❺ Properties – Displays dataset and variable properties

Note: Grey Bar at Bottom of the Screen – Displays current working directory

PC and MAC

PC:

MAC:



Descriptions

- Open – Open a Stata-related file
- Save – Save a Stata-related file
- Print – Print output displayed in the results window
- Log – Begin, close, suspend, or resume a log file
- Viewer – Displays help files
- Graph – Launches the graph window

Descriptions

- Do-file Editor – Launches the Do-file editor
- Data Editor/Browser – Launches the Data viewer
- Variables Manager – Lists the variables in the current dataset; allows for the editing of variables
- More – Display results that do not fit in the results window
- Break – Stops the execution of a command
- Search Help – Searches for help for Stata-written and user-written commands

PC

Data Editor (Browse) - 'auto.dta'

File Edit View Data Layout

make,1

	make	price	mpg	rep78	headroom
1	AMC Concord	4,099	22	3	2.0
2	AMC Pacer	4,749	19	3	1.9
3	AMC Spirit	6,799	23	-	3.0
4	Buick Century	9,816	20	3	4.0
5	Buick Electra	7,827	18	4	5.0
6	Buick LeSabre	5,769	18	3	4.0
7	Buick Regal	4,439	20	3	1.9
8	Buick Regal	6,169	20	3	2.0
9	Buick Wildcat	10,392	16	3	3.0
10	Buick Skylark	1,082	18	3	3.8
11	Cad. Deville	11,365	14	3	4.0
12	Cad. Eldorado	14,509	14	2	1.9
13	Cad. Seville	16,906	21	3	3.0
14	Chev. Chevette	3,709	20	3	2.0
15	Chev. Impala	6,765	18	4	5.0

Variables

filter variables here

Name	Label
<input checked="" type="checkbox"/> make	Make and Model
<input checked="" type="checkbox"/> price	Price
<input checked="" type="checkbox"/> mpg	Mileage (mpg)
<input checked="" type="checkbox"/> rep78	Repair Record 1978
<input checked="" type="checkbox"/> headroom	Headroom (in.)

Variables Snapshots

Properties

Variables

Name	Label
make	Make and Model
price	Price
mpg	Mileage (mpg)
rep78	Repair Record 1978
headroom	Headroom (in.)

Data

Ready Length: 18 Vars: 12 Order: Dataset Obs: 74 Filter: Off Mode: Browse CAP NUM

MAC

Data Editor (Browse) — auto.dta

Filter Variables Properties Snapshots

make[1] AMC Concord

	make	price	mpg	rep78	headroom
1	AMC Concord	4,099	22	3	2.5
2	AMC Pacer	4,749	17	3	3.0
3	AMC Spirit	3,799	22	.	3.0
4	Buick Century	4,816	20	3	4.5
5	Buick Electra	7,827	15	4	4.0
6	Buick LeSabre	5,788	18	3	4.0
7	Buick Opel	4,453	26	.	3.0
8	Buick Regal	5,189	20	3	2.0
9	Buick Riviera	10,372	16	3	3.5
10	Buick Skylark	4,082	19	3	3.5
11	Cad. Deville	11,385	14	3	4.0
12	Cad. Eldorado	14,500	14	2	3.5
13	Cad. Seville	15,906	21	3	3.0
14	Chev. Chevette	3,299	29	3	2.5
15	Chev. Impala	5,705	16	4	4.0

Vars: 12 Order: Dataset Obs: 74

Length: 18 Filter: Off

Variables

Name	Label
<input checked="" type="checkbox"/> make	Make and Model
<input checked="" type="checkbox"/> price	Price
<input checked="" type="checkbox"/> mpg	Mileage (mpg)
<input checked="" type="checkbox"/> rep78	Repair Record 1978
<input checked="" type="checkbox"/> headroom	Headroom (in.)

Properties

▼ Variables

Name	make
Label	Make and Model
Type	str18
Format	%-18s
Value label	
Notes	

▼ Data

► Filename	auto.dta
Label	1978 Automobile Data

Modes

- Data Editor (Edit) – Allows one to view a dataset, and make changes
- Data Editor (Browse) – Allows one to view the dataset, but not make any changes
- Can switch between edit mode and browse mode
- NOTE: When switching from browse mode to edit mode, a warning will appear, whether the user is sure about switching from browse mode to edit mode

Colors

When viewing a dataset in the Data Editor/Browser, different types of data is represented by different colors

- Black – Data used for various descriptive and analytic tasks
- Red – Observations that contain strings, or textual data; can perform descriptive tasks, but not analytic tasks
- Blue – Same as data appearing in black, except the blue represents value labels; can perform both descriptive and analytic tasks
- NOTE: Default is for the Data Editor/Browser to display the value labels, if any for the variables

Full Command Syntax

[by varlist:] *command* [*varlist*] [=exp] [**if** *exp*] [**in** *range*] [*weight*] [**using** *filename*] [*options*]

command

- Only required element of command statement
- Case-sensitive
- Commands can be abbreviated
- Example: To display summary statistics of a variable, or variables:
 - summerize
 - sum
 - The underlined portion of summerize represents the abbreviation

varlist

- Represents one variable, or at least two variables
- Case-sensitive
- Variables can be abbreviated to minimum number of letters that makes variable unique
- To refer to several variables at the same time:
 - Use the * symbol
 - Use a name range

$=exp$

- Used to generate new variables
- Can include variables in expression statements
- Usually an arithmetic expression
 - Can include the four basic operation symbols (+, −, *, /)
 - Can use ^ for an exponentiation statement
 - Can include other functions, such as *abs* and *log*
 - Can include parentheses to manage order of operations

if *exp* and in *range*

- Used to restrict dataset to a subsample of interest
- Represented as a logical statement that is either true or false
- Relation operators are $<$, $<=$, $=$, $>=$, $>$, and $!=$
- Can also specify a range of observations
- Example: `in 1/10` refers to the first ten observations of a dataset

weights

- Used to weigh the observations
- Example: survey data typically uses weights in order to make the sample representative of the population
- Used in conjunction with many commands

using *filename*

- Introduces a file into the command
- File can be on the computer, on a network, or on the internet

options

- Most commands have additional options that the user can specify
- Look at the help file for the command to list its options

by *varlist*

- Used to execute a command for groups of observations defined by distinct values of the variable(s) specified
- Command in question has to be "byable"
- Data must be sorted by the grouping variable
- If data is not pre-sorted, use `bysort`

What are Do-files?

- Typically, the Stata command line only allows the user to run individual commands, not collectively.
- A Do-file is a file that allows the user to run a number of commands at once.
- Do-files allow the user to keep a record of their analysis.

Commands

- Do-files can consist of commands that require either a single line, or multiple lines.
- Commands that span a single line are the same as typing the command into the command line on the main Stata window.
- Commands that span multiple lines requires a delimiter (i.e. a character, or group of characters, Stata recognizes signifying the end of the command).
- The default delimiter is a carriage return (CR)
- Can treat carriage return as a comment using three forward slashes `///`.
- Commands that run multiple lines cannot be executed in the main Stata command line.

Comments

- Do-files allow the user to insert any necessary comments with respect to the Do-file.
- Ways to include comments:
 - An asterisk – *
 - Enclosed with – /* */
- Lines that are commented are not executed by Stata.

Execution

- There are two ways to execute commands in a Do-file.
 - Method 1: Execute the entire file.
 - Method 2: Execute the file in pieces via highlighting the specific code you want to execute.
- You can also nest Do-files within other Do-files.

Commands

- `doedit` launches the Do-file editor with a blank do-file.
- `doedit [filename]` launches the Do-file editor with the specified do-file.
- `do filename` executes all commands stored in specified do-file.

Opening the Data

- The command for opening a dataset in Stata is `use`.
- If a dataset is already open, opening a new dataset requires including the option `clear` with the `use` command.
- Examples
 - Example: `use filename` works if there is no data in Stata's memory.
 - Example: `use filename, clear` works if data is already in memory.

describe

describe provides basic information about a Stata dataset.

describe [*varlist*] provides basic information about specified variables.

- Number of observations and variables
- Size of file (in bytes)
- Most recent timestamp
- Summary Information
 - Variable Name
 - Storage Type
 - Display Format
 - Value Label
 - Variable Label

summarize

summarize gives summary statistics for the variables in the dataset.

summarize [*varlist*] provides summary statistics for specified variables.

- Number of Observations
- Mean
- Standard Deviation
- Minimum
- Maximum

The option `detail` provides additional statistics.

- Skewness
- Kurtosis
- Four largest (smallest) values
- Various percentiles (1, 5, 10, 25, 50, 75, 90, 95, 99)

tabulate (One-way)

- `tabulate varname` or `tab1 varlist` produces a frequency table for a variable, or list of variables.
 - Example: `tab var1`
- However, using `tab` alone will not provide frequencies with respect to missing observations.
- Frequencies of missing observations requires including the option missing.
 - Example: `tab var1, m`
- Default is to produce a frequency table featuring value labels
- Creating a frequency table without value labels requires including the option nolabel
 - Example: `tab1 var1 var2 var3, nol`

tabulate (Two-way)

- `tabulate varname1 varname2` or `tab2 varlist` produces a contingency table for a pair of variables.
 - Example: `tab var1 var2`
 - Usually, dependent variable is listed first, followed by independent variable
- Can report row, column, and cell relative frequencies using `row`, `column`, and `cell` options.
- Can report various measures of association (e.g., Chi-Squared (χ^2), Cramer's V) (See `help tabulate twoway` for full list of options)

codebook

`codebook` examines the variable names, labels, and data to produce a codebook describing the dataset.

`codebook [varlist]` provides a codebook for the specified variables.

- Variable Name and Variable Label
- Type
- Value Label
- Range (Smallest and Largest Values)
- Unique Values
- Units
- Missing
- Tabulation (Small number of unique values)
 - Frequency
 - Numeric Value
 - Value Label

New Features in Stata 15

Stata 15 includes a number of refinements and new features, including:

- `bayes:` prefix for estimating Bayesian regression models
(Example: `bayes: regress depvar indvar1 indvar2`)
- Markdown and dynamic documents – Integrating Stata code into documents (e.g., results graphs)
- Including transparency features into graphs
- Number of new methods
 - Spatial Autoregressive Models
 - Bayesian Multilevel Models
 - Nonlinear Multilevel Models

[Click here for the full list of new features.](#)

Available Resources

- Stata Documentation
- Stata Press
- UCLA Institute for Digital Research and Education
- Stata Cheat Sheets
- ISRC Workshops

Any Questions?