Introduction to Stata

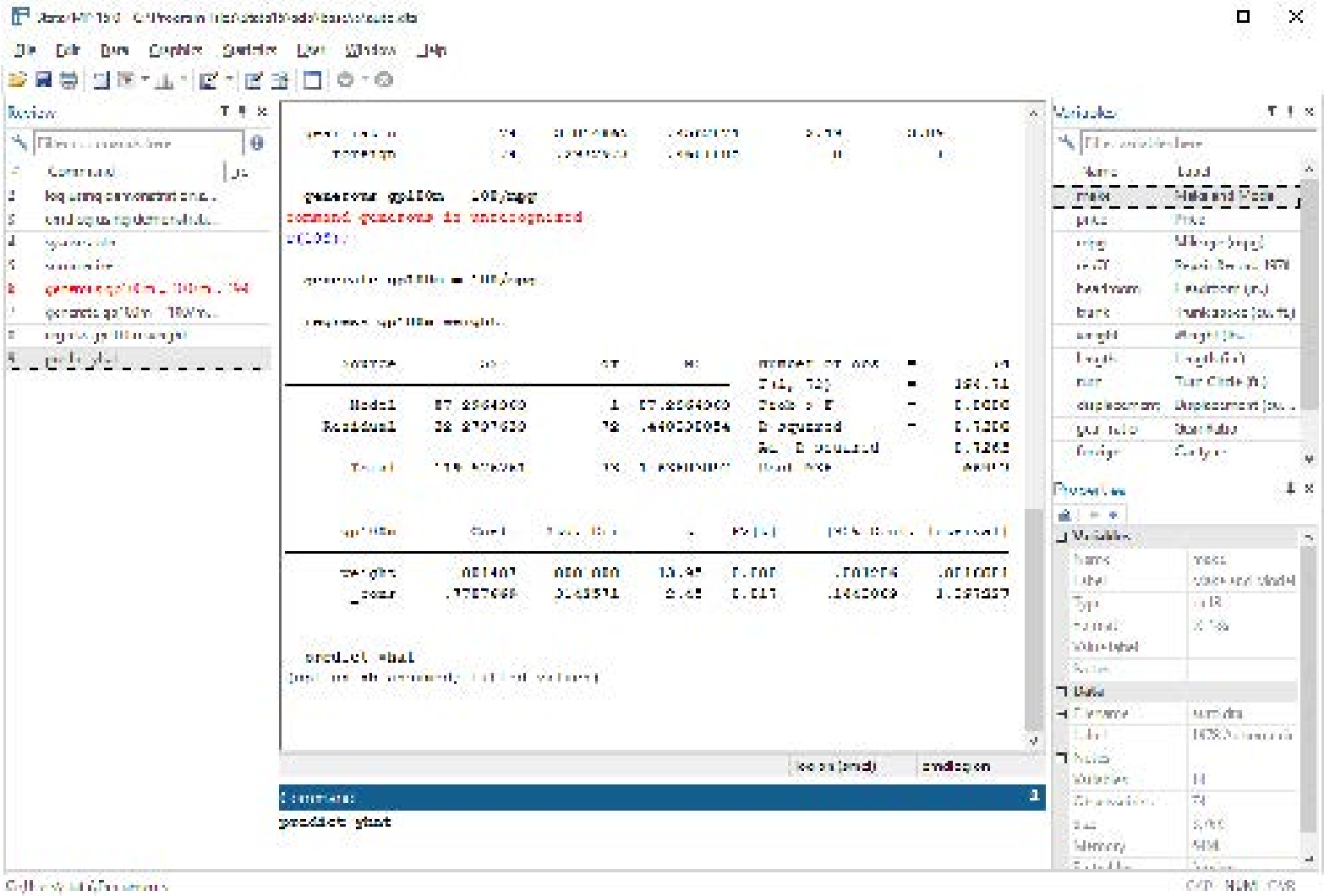
Iowa Social Research Center (ISRC) Workshop

Desmond D. Wallace

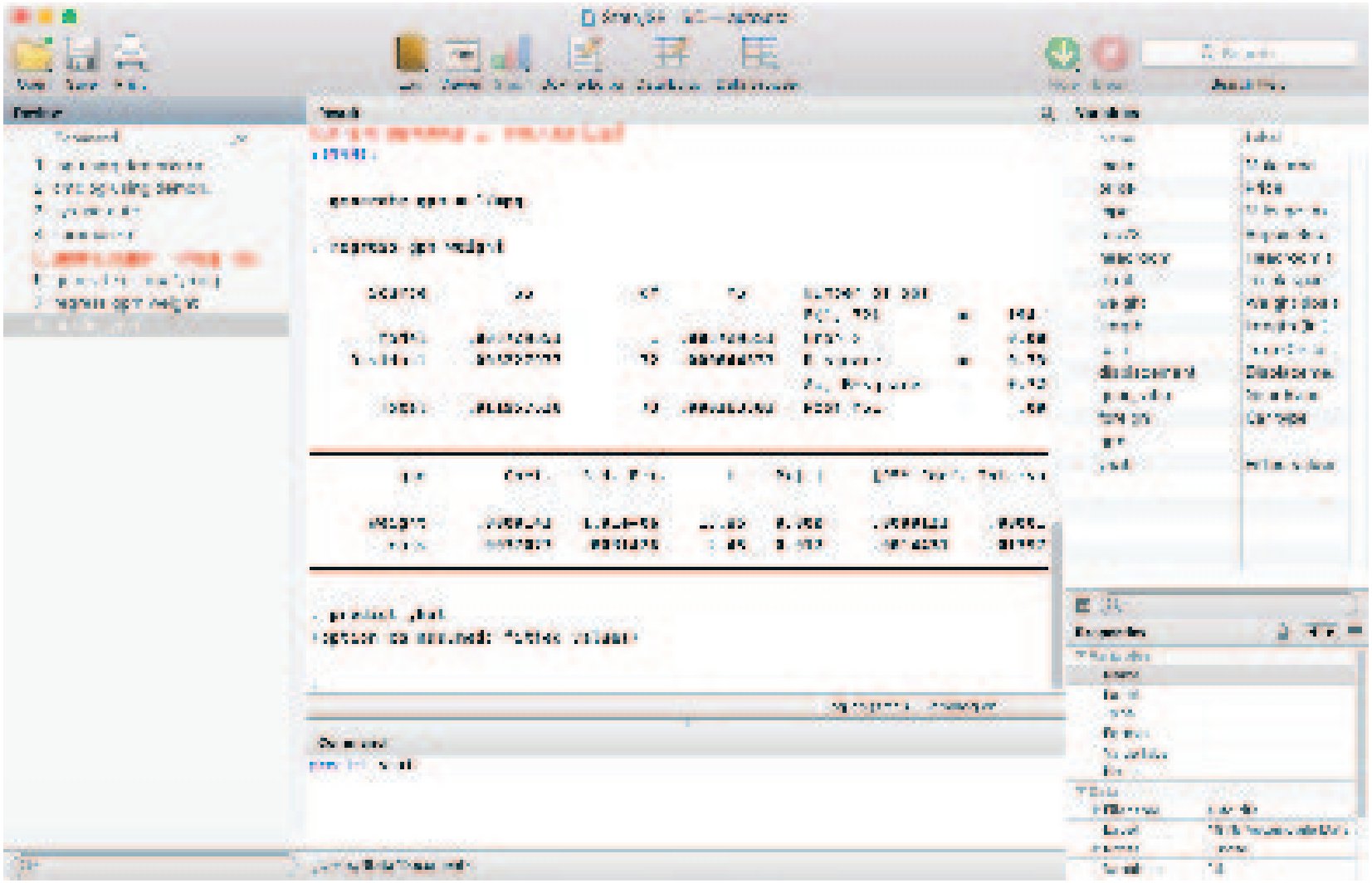
Department of Political Science
The University of Iowa
Iowa City, IA

September 15, 2017

PC



MAC



Descriptions

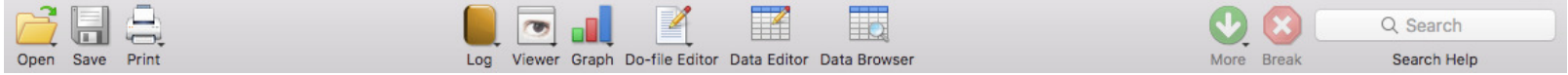
1. Command – Type commands
2. Results – Executed commands and resulting output
    1. Current and Command log status
3. Review – Past commands from current session
4. Variables – Variable list of current dataset
5. Properties – Displays dataset and variable properties

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

PC and MAC

PC:

MAC:



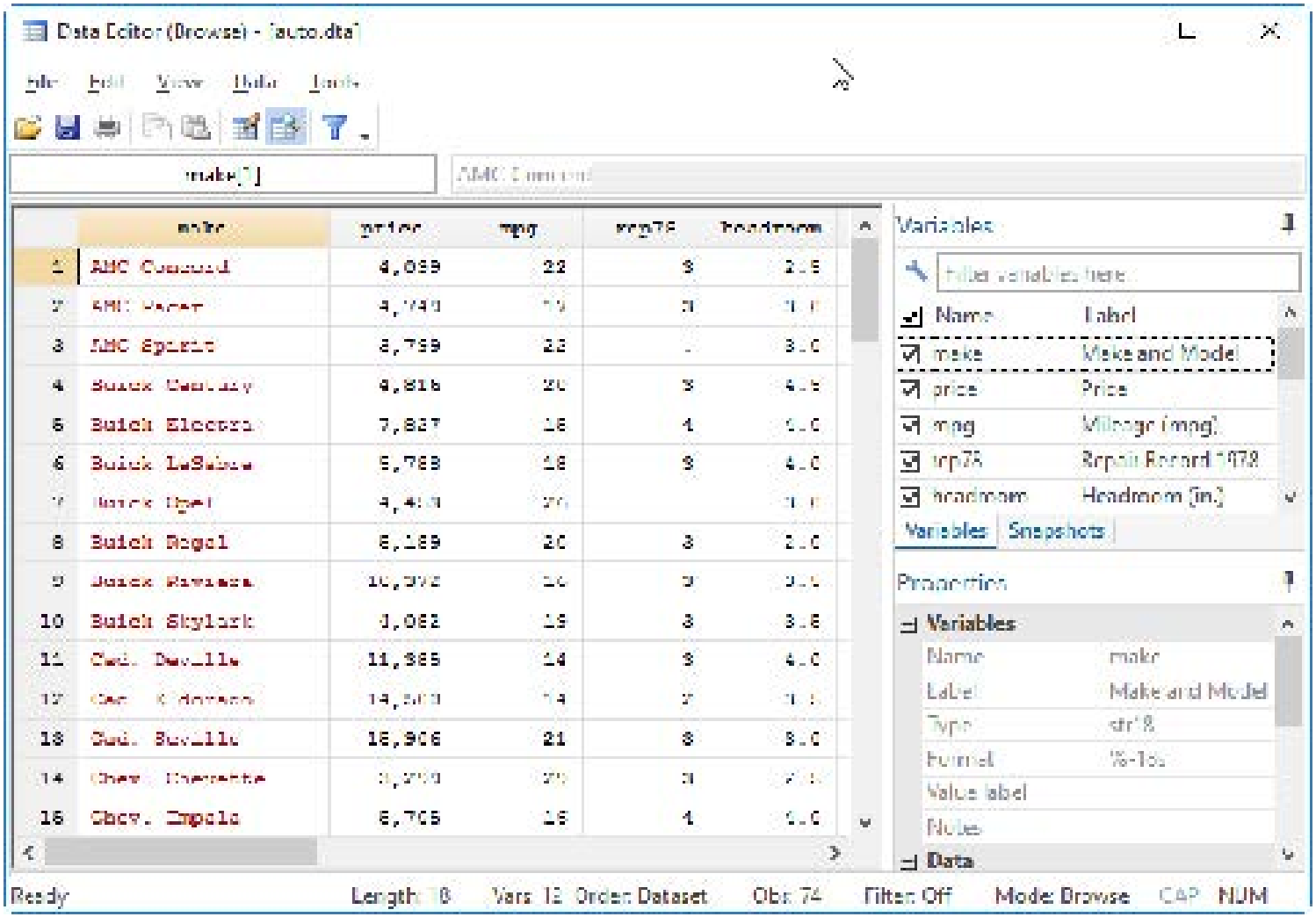
Descriptions

- 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

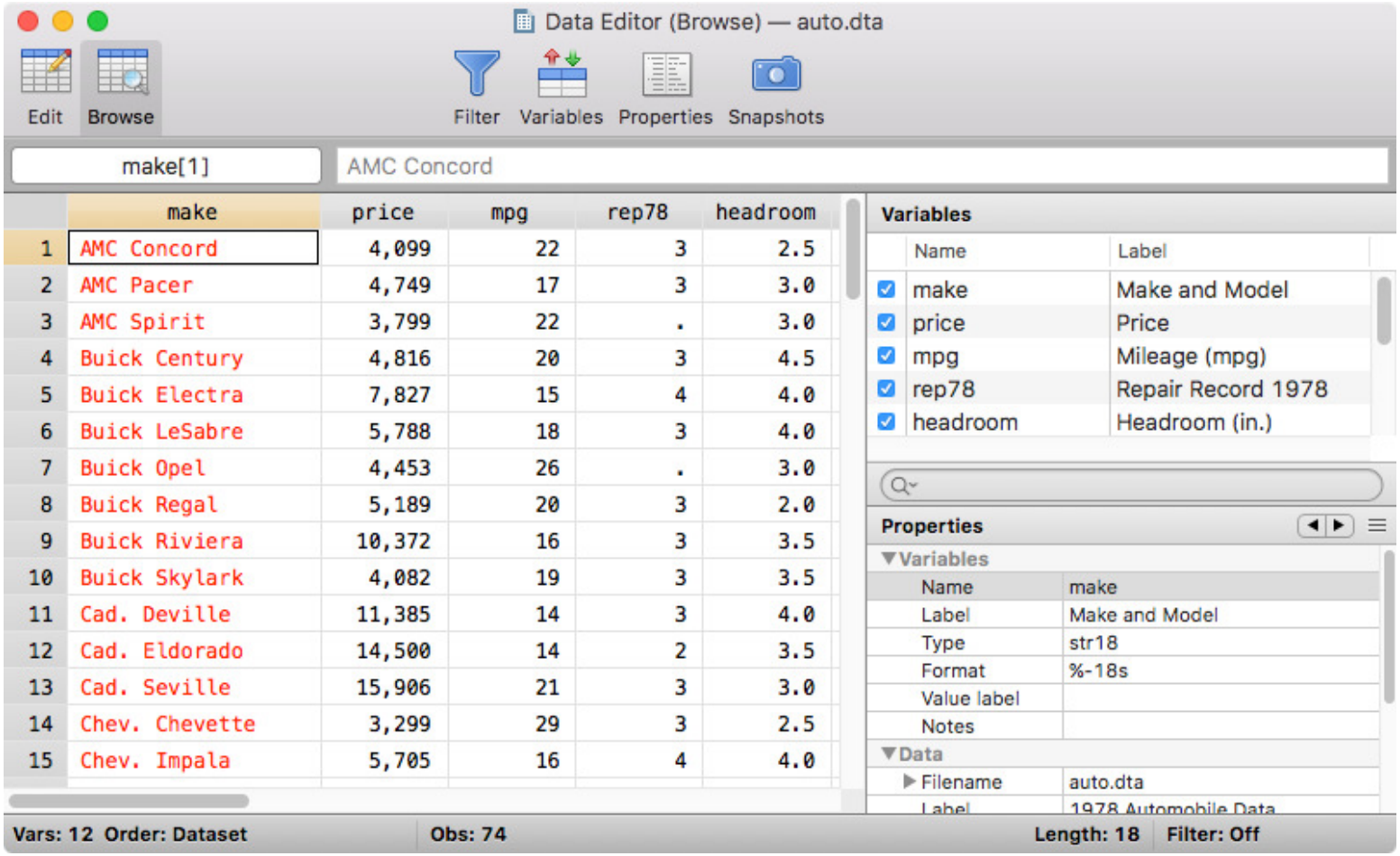
Descriptions

- 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
make[1]
Variables
Properties
Ready

MAC



	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

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

What is a Log file?

- A file that keeps a "permanent" record of the output displayed in the Results window
- When a log file is open, Stata will write the results of executed commands to both the Results window and the log file

Commands

- Basic Command: `log using` *`filename`*
  - *filename* is the name user gives to the log file
- Most Common Options: `text` and `replace`
  - `text` gives the log file a .txt file extension, which allows the file to be opened in another text editor (e.g. Notepad, Notepad++, Sublime Text, Atom)
  - `replace` tells Stata to overwrite the file if a file with the same filename already exists
- To close an open log file, use `log close`

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?