Introduction to STATA

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Learning Objectives

- Familiarity with STATA environment
- Opening and closing STATA
- About the working directory
- Creating and maintaining ‘do’ and ‘log’ files
- Use of help files
- Some basic STATA commands
- Data processing

Introduction: Why use Stata?

According to www.stata.com:

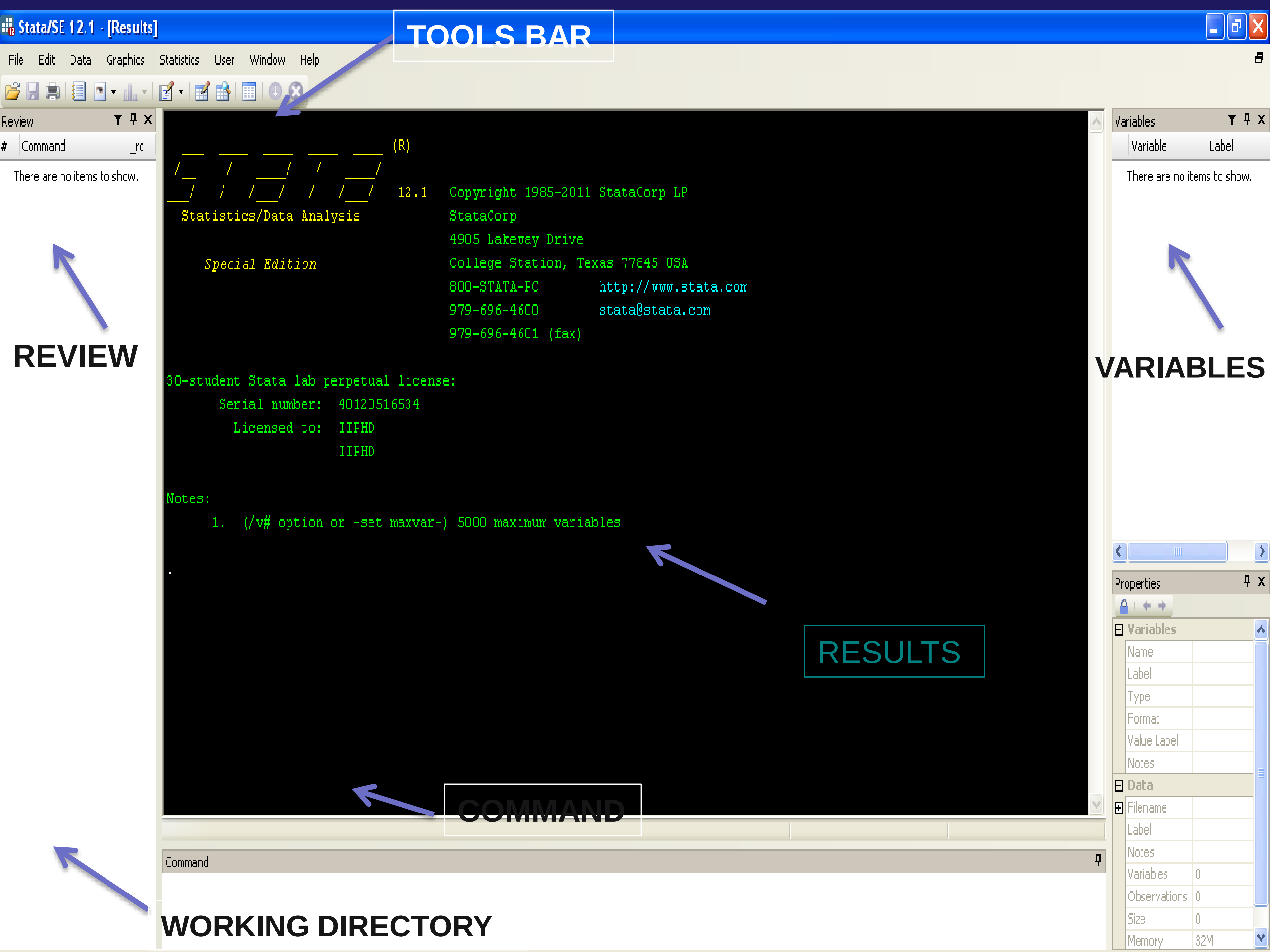
- Stata is a complete, integrated statistical package that provides everything you need for data analysis, data management, and graphics
- Fast, accurate, and easy to use
- Broad suite of statistical capabilities
- Complete data-management facilities
- Publication-quality graphics
- Technical support and learning resources

Menus vs. Commands

- Stata has a set of pull-down menus of commands.
    - Allows user to get results without needing to know syntax.
    - Alternatively, command syntax allows user to reproduce results easily.
        - Convenient if your datasets are updated repeatedly.

Window Layout

- Stata has different windows.
    - Command: where commands are entered.
        - All commands and variables are case sensitive.
    - Results: where results appear.
    - Review: where past commands are listed.
        - Clicking a past command in Review window brings it to the command window where it can be modified and re-executed.
    - Graph: where graphs are displayed (appears only when graphs are requested).
    - Variable: where variables in current dataset are listed.



TOOLS BAR

REVIEW

VARIABLES

RESULTS

COMMAND

WORKING DIRECTORY

```
  ___  ____  ____  ____  ____ (R)
 /__    /   ____/   /   ____/
___/   /   /___/   /   /___/   12.1   Copyright 1985-2011 StataCorp LP
  Statistics/Data Analysis            StataCorp
                                      4905 Lakeway Drive
     Special Edition                  College Station, Texas 77845 USA
                                      800-STATA-PC        http://www.stata.com
                                      979-696-4600        stata@stata.com
                                      979-696-4601 (fax)

30-student Stata lab perpetual license:
       Serial number:  40120516534
         Licensed to:  IIPHD
                       IIPHD

Notes:
      1.  (/v# option or -set maxvar-) 5000 maximum variables

.
```

Opening STATA

- Double click the STATA shortcut icon from the desktop
- Go from the start button
- Double click the STATA file directly

Closing STATA

- Click on the Close icon (red cross) at the top right hand corner
- Type ‘exit’ in the Command Window
- Select ***Exit*** from the ***File*** menu

Working directory

- By default STATA will save the files in the folder where STATA was installed initially
- But the directory can be changed to some other where you want to save your files
- The command for changing the working directory is:

```
cd “path of the folder”
```

- For example in my laptop, the command will be:

```
cd “D:\Stata\Impact Evaluation”
```

Command Syntax

- Commands should always be in lower case
- STATA is very sensitive to spelling mistakes

Convention for the STATA command

```
[prefix:]command varlist [if] [in] [weights] [,options]
```

For example

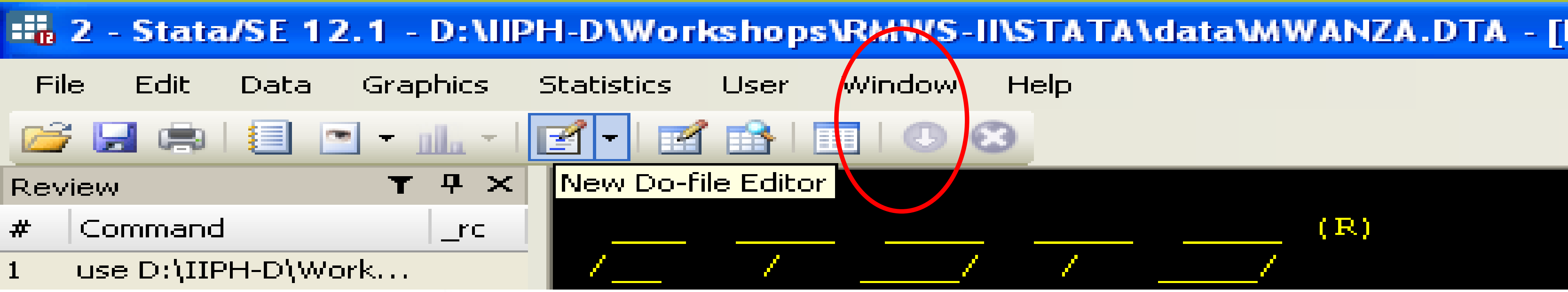
```
summarize var_name
sum var_name if var_name==1
sum var_name in 1/100
sum var_name if var_name ==1 in 1/100
sum var_name if var_name ==1, detail
bysort var_name: sum var_name, detail
```

‘do’ files

- A do-file is a text (also called batch) file with a series of commands to be executed in order by Stata.
- Also great for composing, revising, and saving Stata commands.
- To use a do-file:
  - Click on Do-File Editor.
  - Enter commands.
  - Save file with .do extension.
- To execute a do-file:
  - Via command: **do** pathoffile/filename.do.
  - Via drop- menu: File → Do …

‘do’ files

- What it does?
  - It saves all your commands
  - You can use these do files later and execute commands directly from the do file
- How to create a do file?
  - Click on the short cut toolbar
  - Window > Do-file editor> New Do-file editor

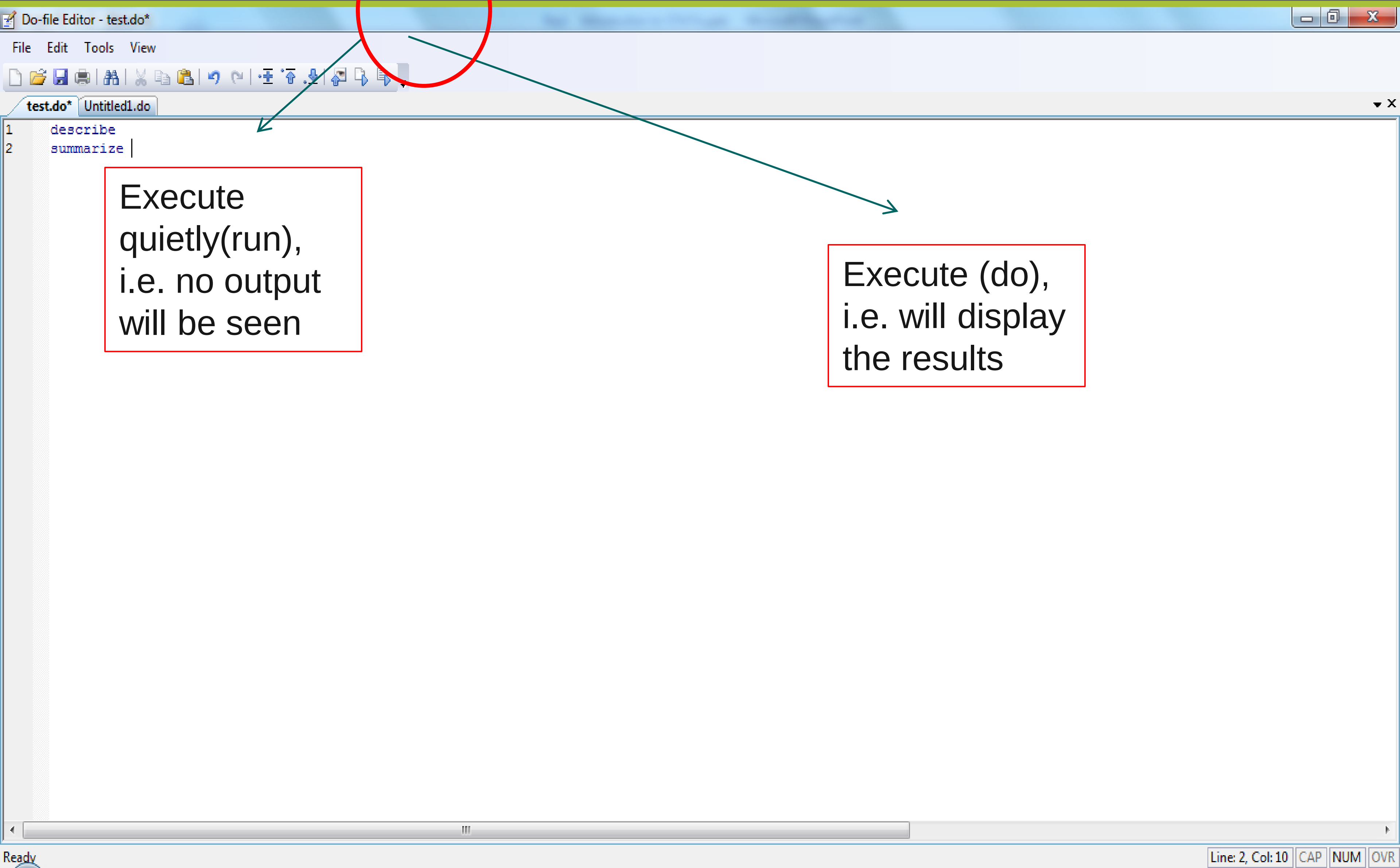


1 use D:\IIPH-D\Work...

‘do’ files

- Maintaining a ‘do’ file
  - Write commands directly in the do file
  - Copy and paste commands from the review window of STATA
  - Save the do file with the ‘.do’ extension
- Opening a do file
  - Open a new do file editor, then open the required do file from the ‘file’ menu

Executing the commands using do-files



```
describe
summarize
```

Execute quietly(run), i.e. no output will be seen

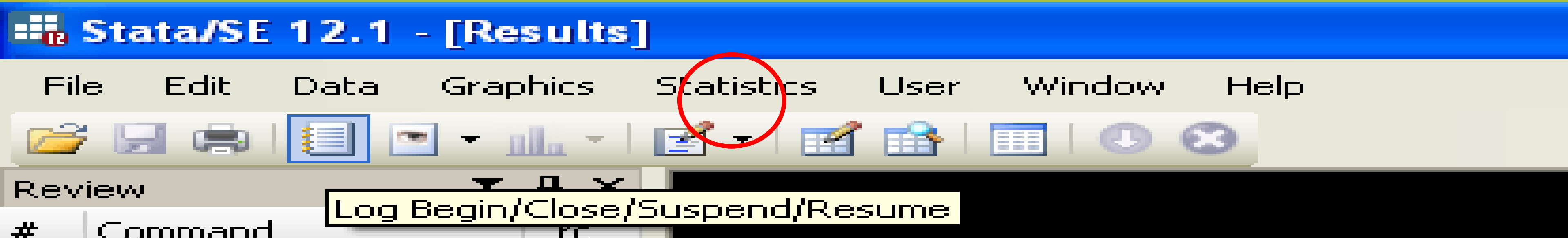
Execute (do), i.e. will display the results

‘log’ files

- Can be used to record (and print):
  1. Executed commands.
  2. Resulting output (except for graphs).
- Recommend that the first thing you do in Stata is open a log file.
- Two types of Log files:
  - Unformatted Log files:
    - Lacks formatting, but is simpler to use if you plan to insert and edit in text editor.
    - Common file extension: .log.
  - Formatted Log files:
    - “**S**tata **M**arkup and **C**ontrol **L**anguage” file. Great for viewing and printing within Stata.
    - Common file extension: .smcl.

‘log’ files

- What it does
  - It saves all your output
  - By default it gets save as ‘.smcl’ extension, but prefer to save as ‘.log’ format
- How to create?
  - Click on the shortcut tool bar
  - It will ask to save the same
  - After opening, whatever you will execute will get saved



Creating/Suspending/Closing log files

- You can suspend the log file at any time and resume again by typing the following:

```
log off
log on
```

- For closing a log file, type:

```
log close
```

- Want to append after closing the log file, type:

```
log using file_name, append
```

- Want to replace the old file with a new one, type:

```
log using file_name, replace
```

How to use STATA help

- By using STATA help menu
- By using STATA commands as follows:

```
help (command_name)
findit (keyword)
```

- For example
  - `help summarize`
  - `findit table`

Inputting Data

- Many Options:
  - Manually enter data into the Stata Data Editor.
  - Copy data into the Data Editor from another source (ex.: Excel).
  - Importing an ASCII (text) file.
  - Reading in an Excel spreadsheet (tab- or comma-delimited text file).

Inputting Data

- Many Options:
  - Open existing Stata Data file.
    - Common file extension: .dta.
  - Use a conversion package (eg, StatTransfer or DBMSCopy) to read in data from another package (eg, SAS data file).

Importing data into STATA

- Directly copy paste from excel to STATA data editor
- Load an existing dataset saved in STATA's own binary format using the `use` command
- Load an existing dataset saved in excel

```
 import excel datafile_name.xlsx, firstrow
```

- Enter data in key board using `input` or `edit` commands

Loading data using `input`

Type the following in the command window:

```
input age sex income
27 1  12000
45 2  13000
34 1  15000
end
```

If the variable sex is a string , then

```
input age str6 sex income
```

Loading data using `.edit`

- `edit` or click on the data editor short cut in the menu bar
- Enter the data as you enter in spread sheet
- What is typed in the first cell will automatically determined the storage type
- Name the variable by clicking on the variable cell (default name *var1 var2*…..)

Types of data

- Numeric – Black
- Numeric – Blue (Stored as numeric but visible as text)
- String - Red
- Dates (Before formatting) – Red
- Dates (After formatting) - Black

Note: STATA either considers a variable as string or numeric, cannot accept mixed formats

Things to remember before import

- Make sure the files are in the working directory
- If the data is missing leave it blank and not “0” or “NA”
- Even if one cell contains any non numeric entry, the variable will be read as string by STATA

Converting variables type

- You can convert string variable to numeric variable

```
encode var_name [if] [in] , generate(new_var)
```

- Numeric variable to string variable

```
decode var_name [if] [in] , generate(new_var)
[maxlength(#)]
```

- Convert string variables to numeric variables

```
destring [varlist], {generate(newvarlist)
|replace} [destring_options]
```

Operators in STATA

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

Note: the double equal (==) is not a mistake and must be used for equality testing

First look at the data

- Some basic STATA commands to understand the data are as follows:

```
describe
browse
summarize
```

Summarizing Variables

- Continuous variables

```
sum var_name, detail

table var_name, contents (freq mean age sd age)
```

- Categorical variables

`tab var_name`	one way table for one variable
`tab1 varlist`	one way table for all variables listed
`tab var1 var2`	two-way table
`tab2 var_name varlist`	All possible combination of two way tables

Graphical presentation

- STATA commands for some basic graphs

```
histogram var_name, normal
scatter var_name
graph pie var_name,over(var_name)
graph box var_name
```

Basic data processing commands

- Generating a new variable

```
generate new_var=expression [if] [in]
```

- Modifying existing variable

```
replace old_var=exp [if] [in]

recode var_name (rule)(rule)…, generate(new_var)
```

- Reducing data

`drop varlist` (drops variables)

`keep varlist` (keeps variables)

Missing data

- Missing data in STATA appears as “.”
- Missing value in STATA is considered as largest number
- In datasets missing data may be entered as 9, 999
- So if missing values are coded as 999, you can change it to “.” by using following:

```
mvdecode var_name, mv(999)
```

Exploring data

- **Describe:** Describe a dataset
- **List:** List the contents of a dataset
- **Codebook:** Detailed contents of a dataset
- **Log:** Create a log file
- **Summarize:** Descriptive statistics
- **Tabstat:** Table of descriptive statistics
- **Table:** Create a table of statistics

Exploring data

- **Stem:** Stem-and-leaf plot
- **Graph:** High resolution graphs
- **Sort:** Sort observations in a dataset
- **Histogram:** Histogram for continuous and categorical variables
- **Tabulate:** One- and two-way frequency tables
- **Type:** Display an ASCII file

Modifying Data

- **label data:** Apply a label to a data set
- **Order:** Order the variables in a data set
- **label variable:** Apply a label to a variable
- **label define:** Define a set of a labels for the levels of a categorical variable
- **label values:** Apply value labels to a variable
- **List:** Lists the observations

Modifying Data

- **Rename:** Rename a variable
- **Recode:** Recode the values of a variable
- **Generate:** Creates a new variable
- **Replace:** Replaces one value with another value

Managing Data

- **Pwd:** Show current directory (pwd=print working directory)
- **dir** or **ls:** Show files in current directory
- **cd** Change directory
- **keep if:** Keep observations if condition is met
- **Keep:** Keep variables (dropping others)
- **Drop:** Drop variables (keeping others)
- **append using:** Append a data file to current file
- **Merge:** Merge a data file with current file

Analyzing Data

- **ttest:** t-test
- **regress:** Regression
- **predict:** Predicts after model estimation
- **kdensity:** Kernel density estimates and graphs
- **pnorm:** Graphs a standardized normal plot
- **qnorm:** Graphs a quantile plot
- **rvfplot:** Graphs a residual versus fitted plot
- **rvpplot:** Graphs a residual versus individual predictor plot
- **xi:** Creates dummy variables during model estimation

Analyzing Data

- **test:** Test linear hypotheses after model estimation
- **oneway:** One-way analysis of variance
- **anova:** Analysis of variance
- **logistic:** Logistic regression
- **logit:** Logistic regression
- **probit**: Probit regression
- **regress**: Linear regression
- **glm**: generalized linear model
- **xtgee**: panel data analysis (generalized estimation equation)

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References

- *International Workshop on Impact Evaluation of Population, Health and Nutrition Programs conducted by MEASURE Evaluation and PHFI, India (Dr. Ranjana Singh, IIPH Delhi)*
- *A brief Introduction to STATA with 50+ Basic Commands by Tobias Pfaff*
- *www.stata.com*