Programming with Stata 14.1 Cheat Sheet

For more info see Stata's reference manual (stata.com)

1 Scalars — both r- and e-class results contain scalars

scalar x1 = 3
create a scalar x1 storing the number 3

scalar a1 = "I am a string scalar"
create a scalar a1 storing a string

Scalars can hold numeric values or arbitrarily long strings

2 Matrices — e-class results are stored as matrices

matrix a = (4\ 5\ 6)
create a 3 x 1 matrix

matrix b = (7, 8, 9)
create a 1 x 3 matrix

matrix d = b' transpose matrix b; store in d

matrix ad1 = a **** d
row bind matrices

matrix ad2 = a **,** d
column bind matrices

matselrc b x, c(1 3) findit matselrc
select columns 1 & 3 of matrix b & store in new matrix x

mat2txt, matrix(ad1) **saving**(textfile.txt) **replace**
export a matrix to a text file ssc install mat2txt

Displaying & Deleting Building Blocks

[**scalar** | **matrix** | **macro** | **estimates**] [**list** | **drop**] b
list contents of object b or drop (delete) object b

[**scalar** | **matrix** | **macro** | **estimates**] **dir**
list all defined objects for that class

matrix list b
list contents of matrix b

matrix dir
list all matrices

scalar drop x1
delete scalar x1

3 Macros — public or private variables storing text

Globals — available through Stata sessions — Public

global pathdata "C:/Users/SantasLittleHelper/Stata"
define a global variable called pathdata

cd $pathdata — add a **$** before calling a global macro
change working directory by calling global macro

global myGlobal price mpg length
summarize $myGlobal
summarize price mpg length using global

Locals — available only in programs, loops, or .do files — Private

local myLocal price mpg length
create local variable called myLocal with the strings price mpg and length

summarize `myLocal' add a ` before and a ' after local macro name to call
summarize contents of local myLocal

levelsof rep78, **local**(levels)
create a sorted list of distinct values of rep78, store results in a local macro called levels

local varLab: **variable label** foreign can also do with value labels
store the variable label for foreign in the local varLab

Tempvars & Tempfiles — special locals for loops/programs

tempvar temp1 — initialize a new temporary variable called temp1
generate `temp1' = mpg^2 — save squared mpg values in temp1
summarize `temp1' — summarize the temporary variable temp1

tempfile myAuto create a temporary file to be used within a program
save `myAuto' see also tempname

Building Blocks — basic components of programming

R- and E-Class: Stata stores calculation results in two* main classes:

r return results from general commands such as **summary** or **tabulate**

e return results from estimation commands such as **regress** or **mean**

To assign values to individual variables use:

1 Scalars — r individual numbers or strings
2 Matrices — e rectangular array of quantities or expressions
3 Macros — e pointers that store text (global or local)

* there's also s- and n-class

4 Access & Save Stored r- and e-class Objects

Many Stata commands store results in types of lists. To access these, use **return** or **ereturn** commands. Stored results can be scalars, macros, matrices or functions.

summarize price, detail
r **return** list
returns a list of scalars

```
scalars:
      r(N)    =  74
      r(mean) =  6165.25...
      r(Var)  =  86995225.97...
      r(sd)   =  2949.49...
                 ...
```

Results are replaced each time an r-class / e-class command is called

mean price
e **ereturn** list
returns list of scalars, macros, matrices and functions

```
scalars:
      e(df_r)   =  73
      e(N_over) =  1
      e(N)      =  73
      e(k_eq)   =  1
      e(rank)   =  1
```

generate p_mean = r(mean)
create a new variable equal to average of price

generate meanN = e(N)
create a new variable equal to obs. in estimation command

preserve create a temporary copy of active dataframe
restore restore temporary copy to original point set restore points to test code that changes data

Accessing Estimation Results

After you run any estimation command, the results of the estimates are stored in a structure that you can save, view, compare, and export

regress price weight
estimates store est1
store previous estimation results est1 in memory

Use **estimates store** to compile results for later use

eststo est2: **regress** price weight mpg ssc install estout
eststo est3: **regress** price weight mpg foreign
estimate two regression models and store estimation results

estimates table est1 est2 est3
print a table of the two estimation results est1 and est2

Exporting Results

The **estout** and **outreg2** packages provide numerous, flexible options for making tables after estimation commands. See also **putexcel** command.

esttab est1 est2, se star(* 0.10 ** 0.05 *** 0.01) label
create summary table with standard errors and labels

esttab using "auto_reg.txt", replace plain se
export summary table to a text file, include standard errors

outreg2 [est1 est2] using "auto_reg2.txt", see replace
export summary table to a text file using outreg2 syntax

Additional Programming Resources

bit.ly/statacode
download all examples from this cheat sheet in a .do file

adoupdate
Update user-written .ado files

adolist ssc install adolist
List/copy user-written .ado files

net install package, from (https://raw.githubusercontent.com/username/repo/master)
install a package from a Github repository

https://github.com/andrewheiss/SublimeStataEnhanced
configure Sublime text for Stata 11-14

Loops: Automate Repetitive Tasks

Anatomy of a Loop — see also **while**

Stata has three options for repeating commands over lists or values: **foreach**, **forvalues**, and **while**. Though each has a different first line, the syntax is consistent:

```
foreach x of varlist var1 var2 var3 {
    command `x', option
    ...
}
```

objects to repeat over
open brace must appear on first line
temporary variable used only within the loop
requires local macro notation
command(s) you want to repeat can be one line or many
close brace must appear on final line by itself

Foreach: Repeat Commands over Strings, Lists, or Variables

foreach x **in**|**of** [local, global, varlist, newlist, numlist] {
Stata commands referring to `x'
}

list types: objects over which the commands will be repeated

Strings

```
foreach x in auto.dta auto2.dta {
    sysuse "`x'", clear
    tab rep78, missing
}
```

same as...

loops repeat the same command over different arguments:

```
sysuse "auto.dta", clear
tab rep78, missing
sysuse "auto2.dta", clear
tab rep78, missing
```

Lists

```
foreach x in "Dr. Nick" "Dr. Hibbert" {
    display length ( "`x'" )
}
```

```
display length("Dr. Nick")
display length("Dr. Hibbert")
```

When calling a command that takes a string, surround the macro name with quotes.

Variables

```
foreach x in mpg weight {
    summarize `x'
}
foreach x of varlist mpg weight {
    summarize `x'
}
```

must define list type

- **foreach in** takes any list as an argument with elements separated by spaces
- **foreach of** requires you to state the list type, which makes it faster

```
summarize mpg
summarize weight
```

ForValues: Repeat Commands over Lists of Numbers

```
forvalues i = 10(10)50 {
    display `i'
}
```

iterator
numeric values over which loop will run

Use display command to show the iterator value at each step in the loop

```
display 10
display 20
...
```

Iterators

i = 10/50	10, 11, 12, ...
i = 10(10)50	10, 20, 30, ...
i = 10 20 to 50	10, 20, 30, ...

Debugging Code

set trace on (off) — see also **capture** and scalar _rc
trace the execution of programs for error checking

Putting It All Together

sysuse auto, clear

```
generate car_make = word(make, 1)        — pull out the first word from the make variable
levelsof car_make, local(cmake)          — calculate unique groups of car_make and store in local cmake
local i = 1                              — define the local i to be an iterator
local cmake_len : word count `cmake'     — store the length of local cmake in local cmake_len
foreach x of local cmake {
    display in yellow "Make group `i' is `x'"
    if `i' == `cmake_len' {              — tests the position of the iterator, executes contents in brackets when the condition is true
        display "The total number of groups is `i'"
    }
    local i = `++i'                      — increment iterator by one
}
```

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inspired by RStudio's awesome Cheat Sheets (rstudio.com/resources/cheatsheets)

geocenter.github.io/StataTraining

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