	SPSS	SAS	Stata
Format discussed in this help sheet (others may exist)	point-and-click (To see syntax, use point-and-click commands, click on "paste." Pastes syntax for command in a new window.)	syntax	syntax
Work environment	Data/variable view Pull-down menus for data manipulation and analyses Output contains log and results	Program editor for programming (data manipulation and analyses) Log shows data analyses run and any messages Output contains results	Command window OR Do file for programming Log file contains log and results
Missing values for numeric variables (.)	Largest value	Smallest value	Largest value
Case, spacing, abbreviations	(syntax not case-sensitive, except when recoding string variables)	Case and spacing between words don't matter Cannot abbreviate commands	Case and spacing matter - Stata commands in lower case Can abbreviate (underlined in documentation)
End of line delimiter	(syntax uses a period)	Semi-colon (;)	Carriage return is default. If you use this default, keep typing code on one line. Can use /// at the end of line or set a different delimiter. If you want a semi-colon, type "#delimiter ;"
Keeping a record of your session	Save output file when you are finished with session	Save log file and output when you are finished with session	Start log file at beginning of session; close log file at end

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Getting data into program (when data is formatted for program)	File → Open → Data… → Click Open	```libname mydata "f:\data";``` ```data a; set mydata.wave1;```	```use "f:\data\wave1.dta", clear```
Create/save new data set from old or overwrite old data set	File → Save As → Click Save File → Save → Click Save	```data new; set old; run;``` ```data new; set new; run;```	```save "f:\data\wave1a.dta"``` ```save "f:\data\wave1a.dta" , replace``` • use if wave1a.dta already exists, but you want to overwrite it
Merge data	Data → Merge files → Add variables → Choose an SPSS data file to merge onto active data set → Choose variables to include and variable (like *id*) to merge by → OK	```proc sort data = a; by id; run;``` ```proc sort data = b; by id; run;``` ```data c; merge a b; by id; run;```	Data set that is open will be master file onto which other data set is merged (data sets must be sorted by common variable first). ```sort id``` ```merge id using "f:\b.dta"```
Concatenate data	Data → Merge files → Add cases → Choose an SPSS data file to merge onto active data set → Choose variables to include. → OK	```data c; set a b; run;```	Data set that is open will be master file onto which other data set is merged. ```append using "f:\b.dta"```
Description of data set (variables included)	Variable view	```proc contents; run;```	```describe```

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List values of variables
 	
• **for all cases**
 	
• **for specific number of cases**
	Analyze → Reports → OK Case Summaries
	• Unselect boxes "Limit cases to first…" and "Show only valid cases"
	• Select box "Limit cases to first…"
		```proc print;```
		```var x1 x2;```
		```run;```
		
		```proc print data=wave1```
		``` (obs=100);```
		```var x1 x2;```
		```run;```
			```list x1 x2```
			
			```list x1 x2 in 1/100```

Keep/drop variables	In data or variable view, can select variable's column or row; right click; click on Clear to drop variables.	```data wave1 (keep=x1 x2);```
		```set wave1;```
		```run;```
		
		```data wave1 (drop=x1 x2);```
		```set wave1;```
		```run;```
			```keep x1 x2```
			
			```drop x1 x2```

Keep/select observations that meet some criterion (e.g. keep only males)	Data → Select cases → Click button "If condition is satisfied" → Click "If" → Type "male = 1" in box. → OK	```data wave1;```
		```set wave1;```
		```if male=1;```
		```run;```
			```keep if male==1```

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Value labels	In Variable View, click on Value for variable. Enter value and label, click add, etc.	1: Define values
		
		``
		proc format;
		value sex
		  1="male"
		  2 ="female";
		run;
		``
		
		2: Assign value labels to variables in data step.
		
		``
		data new; set new;
		format gender sex.;
		run;
		``
			1: Define values
			
			``
			label define sex 1 "male"
			  2 "female"
			label define likert 1 "sd"
			  2 "d" 3 "nad" 4 "a" 5
			  "sa"
			``
			
			2: Assign value labels to variables
			
			``
			label values gender sex
			label values var1 likert
			label values var2 likert
			``

Create new variables **Create variable *gender* that is same as existing variable *b3***	Transform → Compute variable → Type name of new variable (*gender*) in box "Target variable"; Type name of old variable (*b3*) in "Numeric expression" box → OK	`gender = b3;`	`generate gender = b3`
Create variable *x2* that equals existing variable *x1*1000*	Transform → Compute variable → Type name of new variable (*x2*) into "Target variable"; Type expression *x1*1000* → OK	`x2 = x1*1000;`	`generate var2 = x1*1000`

Create variable *male* (1=male, 0=female) from variable *sex* (1=male, 2=female)	Transform → Recode into different variables → Enter new variable name and old variable name → Enter old and new values by clicking "Old and new values" → Specify "if" conditions if necessary by clicking "If" button → OK	```
		male =.;
		if sex=1 then male = 1;
		else if sex = 2 then male
		  = 0;
		``
			``
			generate male = 1
			replace male = 0 if sex==2
			``

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Commands with "if"	When computing and recoding variables, SPSS allows you to specify "if" conditions	1st: condition
		2nd: something happens
		if…then…
		
		`if gender=1 then male=1;`
		`else if gender=2 then`
		`  male=0;`
			1st: command
			2nd: condition
			generate … if …

Reverse code variables	Transform → Recode into different variables (or same variables) → Enter new variable name and old variable name → Enter old and new values by clicking "Old and new values" → Specify "if" conditions if necessary by clicking "If" button → OK	`if x1 = 1 then x1r = 5;`
		`if x1 = 2 then x1r = 4;`
		`if x1 = 3 then x1r = 3;`
		`if x1 = 4 then x1r = 2;`
		`if x1 = 5 then x1r = 1;`
			`recode x1 x2 (1=5) (2=4)`
			`  (3=3) (4=2) (5=1)`

	Transform → Compute variable → Enter name of new variable and numeric expression (e.g. $x1r = 6 - x1$) → OK	`x1r = 6 - x1;`	`generate x1r = 6 - x1`

Recode multiple numeric missings to "."	With point-and-click, must recode individually	`data new; set new;`
		`    array miss {3} x1 x2`
		`  x3;`
		`    do i = 1 to 3;`
		`      if miss{i} = 99 then`
		`  miss{i} = .;`
		`    end;`
		`  run;`
			`foreach i in x1 x2 x3 {`
			`[enter]`
			`replace `i' = . if `i' ==`
			`99 [enter]`
			`}`
			
			(left ` on "i" is key to
			  left of "1" on keyboard)

Frequencies	Analyze → Descriptive Statistics → Frequencies → Choose variables & options → OK	`proc freq;`
		`tables x1 x2 x3;`
		`run;`
			`tab x1 x2 x3`

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Descriptive statistics	Analyze → Descriptive statistics → Frequencies/ Descriptives/Explore etc→ Choose variables & options → OK	`proc means;`
		`var x1 x2 x3;`
		`run;`
		• gives N, mean, std. deviation, min, max
		
		`proc univariate;`
		`var x1 x2 x3;`
		`run;`
		• gives above stats, plus more
			`summarize x1 x2 x3`
			
			`summarize x1 x2 x3, detail`
			
			`codebook var1 var2 var3`

Cross-tabulation
 	
• **w/ chi-squared**
	Analyze → Descriptive statistics → Crosstabs → Choose variables & options → OK
	(for chi-squared, choose "chi-square" under statistics.
		`proc freq;`
		`tables x1*x2;`
		`run;`
		
		`proc freq;`
		`tables x1*x2/chisq;`
		`run;`
			`tab2 x1 x2`
			
			`tab2 x1 x2, chi2`

Correlation	Analyze → Correlate → Bivariate → Choose variables & options → OK	`proc corr;` `var x1 x2; run;`	`pwcorr x1 x2, obs sig`

Independent sample t-test
e.g. compare means on variable *x1* for males versus females
	Analyze → Compare means → Independent-Samples T Test → Choose variables & options → OK	`proc ttest;`
		`class gender;`
		`var x1; run;`
			`ttest x1, by(gender)`

ANOVA (one-way)
e.g. Compare means of *x1* for racial groups.
	Analyze → Compare Means → One-way ANOVA → Choose variables & options → OK	`proc anova;`
		`class race;`
		`model x1 = race;`
		`means race/tukey;`
		`means race/bon;`
		`run;`
			`anova x1 race`

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Simple linear regression e.g. **DV =** *y1*, **IVs =** *x1-x3*	Analyze → Regression → Linear → Choose variables & options → OK	`proc reg;` `model y1 = x1 x2 x3;` `run;`	`reg y1 x1 x2 x3`
Logistic regression e.g. **dichotomous DV =** *y1*, **IVs =** *x1-x3*	Analyze → Regression → Binary Logistic → Choose variables & options → OK	`proc logistic descending;` `model y2 = x1 x2 x3/expb;` `run;`	`logistic y2 x1 x2 x3`

Resources:

Acock, A. C. (2005). SAS, Stata, SPSS: A Comparison. *Journal of Marriage and Family, 67*, 1093-1095.

Blanchett, D. Stata for the Struggling SAS Mind.
(http://www.cpc.unc.edu/services/computer/presentations/sas_to_stata/Stata_for_the_Struggling_SAS_Mind.pdf)

Delwiche, L. D. & Slaughter, S. J. (2003). *The Little SAS Book: A Primer, 3rd Ed.* Cary, NC: SAS Institute, Inc.

Mitchell, M. M. (2007). *Strategically using General Purpose Statistics Packages: A Look at Stata, SAS and SPSS*. UCLA ATS Statistical Consulting Group, Technical Report Series, Report #1.
(http://www.ats.ucla.edu/stat/technicalreports/number1_editedFeb_2_2007/ucla_ATSstat_tr1_1.1_0207.pdf)

Also see Programming Tools on CFDR webpage (http://www.bgsu.edu/organizations/cfdr/page36022.html)