Which statistical software should I use?

A comparison of statistical software at MIT

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Today's workshop

- SAS, Stata, R, JMP, and SPSS
  - Strengths and weaknesses
  - How to access them at MIT
  - Short demos of each

- More information at libguides.mit.edu/stat
  - Resources for learning software
  - Information about individual statistics support
  - Workshop information

SAS

Strengths

- large datasets/multiple datasets
- data management
- programmable
- powerful graphics tools, but can be tricky to learn syntax
- outputs reports to common formats, such as .pdf
- Anova, mixed models, multivariate

Weaknesses

- expensive if not using MIT license
- greater learning curve than SPSS and Stata
- difficult to detect errors in your programs
- limited support for survey data analysis
- ordinal and multinomial logistic regression commands are difficult

Stata

Strengths

- easy to use
- command line and GUI
- easy to identify mistakes in command line
- strong graphics, but can take long to create
- survey data analysis
- many regression packages

Weaknesses

- slower processing of large datasets than SAS
- ANOVA more confusing to use than other statistics programs

R

Strengths

- free
- easy to work with large amounts of data because it is not all displayed at once
- easy to use graphics
- can include mathematical symbols in graphics
- can be used for a wide variety of analyses and new analyses packages are constantly created

Weaknesses

- difficult to learn (no GUI)
- limited documentation
- no method for writing out tabular output
- strength of programs depends on the developer
- analyzes data in working memory (as opposed to accessing an external file), so can be slow with large datasets

SPSS

Strengths

- easy to use
- easy to create graphs
- data entry
- ANOVA – you can perform many kinds of tests for specific effects
- multivariate analysis

Weaknesses

- slower than other stat software with large datasets
- limited data management tools
- written syntax a bit more complicated than other programs

JMP

Strengths

- easy to use
- easy to create graphics
- data exploration/research design

Weaknesses

- slower than other stat software with large datasets
- difficult to find additional test/analyses in output window
- limited data management tools
- not as many statistical tests as other software
- written syntax a bit more complicated than other programs

Interfaces

Software	Interface
SAS	command line
Stata	GUI or command line
R	command line
SPSS	GUI
JMP	GUI

*commands can be saved to and run from a syntax/code file for all programs

Best of statistical software…

Category	Software
Easiest to use	JMP, SPSS, Stata
Best for programming	R
Best for large datasets	SAS
Best for complex data	SAS
Best for data management	SAS
Cheapest	R
Best for exploratory analysis	JMP
Best graphics	R
Easiest data import/export	Stata, JMP, SPSS
Best for data entry	SPSS

How do I get the software?

Software	How to Access it
SAS	Athena
Stata	Athena or purchase from IS&T
R	Athena or download for free
SPSS	Download for free from IS&T (faculty and staff only)
JMP	Download for free from IS&T (teaching and research use only)

Software Links

- SAS on Athena: http://ist.mit.edu/sas-jmp/athena
- Stata on Athena: http://ist.mit.edu/node/1405#stata
- Stata purchase: http://www.stata.com/order/new/edu/gradplans/campus-gradplan/
- R on Athena: http://ist.mit.edu/node/1405#R
- R free download: http://www.r-project.org/
- SPSS MIT download: http://ist.mit.edu/spss/all
- JMP MIT download: http://ist.mit.edu/sas-jmp

Presentation Sources:

- http://www.researchgate.net/post/Spss_or_stata
- http://www.ats.ucla.edu/stat/mult_pkg/compare_packages.htm
- http://en.wikipedia.org/wiki/Comparison_of_statistical_packages
- http://www.science-craft.com/2012/05/22/why-use-r-an-example-of-rs-3-core-strengths/
- http://www.information-age.com/technology/information-management/2099883/putting-the-r-in-analytics
- http://blogs.sas.com/content/jmp/2013/05/21/time-to-move-from-spss-to-jmp/