STOR 320 Data Visualization

Lecture 1 Yao Li Department of Statistics and Operations Research UNC Chapel Hill

Why are We Here?

- To Install Some Key R Packages
 - Tidyverse
- To Practice Coding via R Scripts
- To Learn Elements of ggplot2
- Practice Making Visually Stunning Pictures

Initial Steps in RStudios

Install Tidyverse Package

> install.packages("tidyverse")

- Other Packages To Be Installed
 - RColorBrewer
 - Rmarkdown

Select Install and Search on CRAN

-					
Files	Plot Packages Hel	p Viewer			
0	Install 💽 Update		Q		C
	Name	Description		Version	
User	Library				^
	abind	Combine Multidimensional Arrays		1.4-5	8
	assertthat	Easy Pre and Post Assertions		0.2.0	8
	backports	Reimplementations of Functions Introduced Since R-3.0.0		1.1.2	8
	base64enc	Tools for base64 encoding		0.1-3	8
	BH	Boost C++ Header Files		1.66.0-1	8
	bindr	Parametrized Active Bindings		0.1.1	8
	bindrcpp	An 'Rcpp' Interface to Active Bindings		0.2.2	8
	bitops	Bitwise Operations		1.0-6	8
	broom	Convert Statistical Analysis Objects into Tidy Tibbles		0.5.0	8
	callr	Call R from R		2.0.4	8
	caTools	Tools: moving window statistics, GIF, Base64, ROC AUC, etc.		1.17.1.1	8
	cellranger	Translate Spreadsheet Cell Ranges to Rows and Columns		1.1.0	8
	cli	Helpers for Developing Command Line Interfaces		1.0.0	8
	clipr	Read and Write from the System Clipboard		0.4.1	8
	coda	Output Analysis and Diagnostics for MCMC		0.19-1	8

Initial Steps in RStudios

- To Use the Package
 - Code

> library("tidyverse")

Check Box for Tidyverse

Files	Plots Packages He	p Viewer		
0	Install 💿 Update		Q,	C
	Name	Description	Version	
	tidyverse	Easily Install and Load the 'Tidyverse'	1.2.1	⊗ ^
	tinytex	Helper Functions to Install and Maintain 'TeX Live', and Compile 'LaTeX' Documents	e 0.6	8
	utf8	Unicode Text Processing	1.1.4	8
	viridisLite	Default Color Maps from 'matplotlib' (Lite Version)	0.3.0	8
	whisker	{{mustache}} for R, logicless templating	0.3-2	8
	withr	Run Code 'With' Temporarily Modified Global State	2.1.2	0
	xfun	Miscellaneous Functions by 'Yihui Xie'	0.3	0
	XLConnect	Excel Connector for R	0.2-15	8
	XLConnectJars	JAR Dependencies for the XLConnect Package	0.2-15	8
	xml2	Parse XML	1.2.0	8
	yaml	Methods to Convert R Data to YAML and Back	2.2.0	8
	200	S3 Infrastructure for Regular and Irregular Time Series (Z's Ordered Observations)	1.8-3	8
Syst	em Library			
	boot	Bootstrap Functions (Originally by Angelo Canty for S)	1.3-20	8
	class	Functions for Classification	7.3-14	0
	cluster	"Finding Groups in Data": Cluster Analysis Extended Rousseeu	w et 2.0.7-1	© ~

ggplot2

Help Page: Link

Comes with Preloaded Datasets

i ggplot2 ^{part}	of the tidyverse	Reference
Data		
ggplot2 comes with a selection challenges.	of built-in datasets that are used in examples to illustrate various vi	sualisation
diamonds	Prices of 50,000 round cut diamonds	
economics	US economic time series	
faithfuld	2d density estimate of Old Faithful data	
midwest	Midwest demographics	
mpg	Fuel economy data from 1999 and 2008 for 38 popular car	models of
msleep	An updated and expanded version of the mammals sle	ep dataset
presidential	Terms of 11 presidents from Eisenhower to Obama	
seals	Vector field of seal movements	
txhousing	Housing sales in TX	
luv_colours	colors() in Luv space	

ggplot2 Cheat Sheet

- Many Useful Plots and Charts Provided
 - See Cheat Sheet: <u>Link</u>
 - (Also on Course Website)
 - Called Geoms (Geometric Objects)
 - The Geom you choose Must Comply with the Type of Variables You are Analyzing
- Organized by Type of Data
 - Univariate
 - Bivariate
 - Mixtures of Categorical and Numeric

ggplot2 General Form

ggplot2 General Form

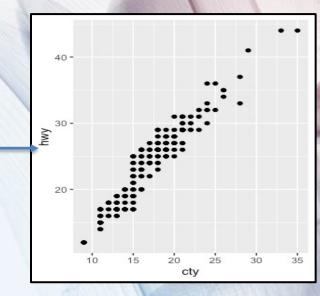
Fill in Blank With Name of Data in R

> ggplot(data=____) +
geom_TYPE(mapping=aes(x=___,y=____, etc.))

• Example:

Fill in Blanks from Variables in Data

> ggplot(data=mpg) +
geom_point(mapping=aes(x=cty,y=hwy))



Tutorial

- Locate Tutorial 1 on Course Website
- Download Rmd File
- Open Rmd File on Computer
- Knit the Rmd File to HTML format
- View Graphs with Me