



Data Visualization

Why are We Here?



- To Install Some Key R Packages
 - tidyverse
 - Rmarkdown
 - knitr
- To Learn Elements of ggplot2
- Make Visually Stunning Pictures that Change Lives

Initial Steps in RStudio



- Install Tidyverse Package
> `install.packages("tidyverse")`
- Try Installing Other Packages Using Dropdown Menu

Select Install and Search on CRAN

The screenshot shows the RStudio interface with the 'Packages' tab selected. A black arrow points from the text 'Select Install and Search on CRAN' to the 'Install' button in the top navigation bar. The 'User Library' section displays a list of packages with columns for Name, Description, and Version. The 'Install' button is highlighted with a black border.

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

Initial Steps in RStudio



- To Use the Package

- Code

```
> library("tidyverse")
```

- Check Box for Tidyverse

Packages			
		Name	Description
<input checked="" type="checkbox"/>	Install	tidyverse	Easily Install and Load the 'Tidyverse'
<input type="checkbox"/>	Update	tinytex	Helper Functions to Install and Maintain 'TeX Live', and Compile 'LaTeX' Documents
<input type="checkbox"/>		utf8	Unicode Text Processing
<input type="checkbox"/>		viridisLite	Default Color Maps from 'matplotlib' (Lite Version)
<input type="checkbox"/>		whisker	{}{mustache} for R, logicless templating
<input type="checkbox"/>		withr	Run Code 'With' Temporarily Modified Global State
<input type="checkbox"/>		xfun	Miscellaneous Functions by 'Yihui Xie'
<input type="checkbox"/>		XLConnect	Excel Connector for R
<input type="checkbox"/>		XLConnectJars	JAR Dependencies for the XLConnect Package
<input type="checkbox"/>		xml2	Parse XML
<input type="checkbox"/>		yaml	Methods to Convert R Data to YAML and Back
<input type="checkbox"/>		zoo	S3 Infrastructure for Regular and Irregular Time Series (Z's Ordered Observations)
System Library			
<input type="checkbox"/>	boot	Bootstrap Functions (Originally by Angelo Canty for S)	1.3-20
<input type="checkbox"/>	class	Functions for Classification	7.3-14
<input type="checkbox"/>	cluster	"Finding Groups in Data": Cluster Analysis Extended Rousseeuw et al	2.0.7-1

ggplot2



- Help Page: [Link](#)

- Comes with Preloaded Datasets

ggplot2 part of the tidyverse Reference

Data

ggplot2 comes with a selection of built-in datasets that are used in examples to illustrate various visualisation challenges.

<code>diamonds</code>	Prices of 50,000 round cut diamonds
<code>economics</code>	US economic time series
<code>faithful</code>	2d density estimate of Old Faithful data
<code>midwest</code>	Midwest demographics
<code>mpg</code>	Fuel economy data from 1999 and 2008 for 38 popular models of car
<code>msleep</code>	An updated and expanded version of the mammals sleep dataset
<code>presidential</code>	Terms of 11 presidents from Eisenhower to Obama
<code>seals</code>	Vector field of seal movements
<code>txhousing</code>	Housing sales in TX
<code>luv_colours</code>	<code>colors()</code> in Luv space

ggplot2



- Many Useful Plots and Charts Provided
 - See Cheat Sheet: [Link](#)
(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



- ggplot2 General Form

Fill in Blank With
Name of Data in R

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

Fill in Blanks from
Variables in Data

Many Examples



- Locate Supplement on Website
- Download Zipped Folder and Unzip
- Open Rmd File on Computer
- Knit the Rmd File to HTML format
- View Graphs with Me

Closing



Disperse
and Make
Reasonable
Decisions