rCharts

Building Data Products

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rCharts

- rCharts is a way to create interactive javascript visualizations using R
- So
  - You don't have to learn complex tools, like D3
  - You simply work in R learning a minimal amount of new syntaxt
- rCharts was written by Ramnath Vaidyanathan (friend of the Data Science Series), who also wrote slidify, the framework we use for all of the lectures in the class
- This lecture is basically going through (http://ramnathv.github.io/rCharts/ (http://ramnathv.github.io/rCharts/))

Example

```
require(rCharts)
haireye = as.data.frame(HairEyeColor)
n1 <- nPlot(Freq ~ Hair, group = 'Eye', type = 'multiBarChart',
  data = subset(haireye, Sex == 'Male')
)
n1$save('fig/n1.html', cdn = TRUE)
cat('<iframe src="fig/n1.html" width=100%, height=600></iframe>')
```

nvD3 run

Slidify interactive

- The above was an example of embedding an rChart in a slidify document
  - In the YAML `yaml ext_widgets : {rCharts: ["libraries/nvd3"]}`
- Or, if you use more than one library
- YAML example `yaml ext_widgets : {rCharts: ["libraries/highcharts", "libraries/nvd3", "libraries/morris"]}`

Viewing the plot

- The object `n1` contains the plot
  - In RStudio, typing `n1` brings up the plot in the RStudio viewer (or you can just not assign it to an object)
- Do `n1$` then hit TAB to see the various functions contained in the object
  - `n1$html()` prints out the html for the plot
- I do `n1$save(filename)` then bring the code back into slidify document
  - This is recommended for slidify, but if you're just looking at the plot, it's unnecessary

Deconstructing another example

```
## Example 1 Facetted Scatterplot
names(iris) = gsub("\\.", "", names(iris))
r1 <- rPlot(SepalLength ~ SepalWidth | Species, data = iris, color = 'Species', type = 'point')
r1$save('fig/r1.html', cdn = TRUE)
cat('<iframe src="fig/r1.html" width=100%, height=600></iframe>')
```

When run

Example 2 Facetted Barplot

```
hair_eye = as.data.frame(HairEyeColor)
r2 <- rPlot(Freq ~ Hair | Eye, color = 'Eye', data = hair_eye, type = 'bar')
r2$save('fig/r2.html', cdn = TRUE)
cat('<iframe src="fig/r2.html" width=100%, height=600></iframe>')
```

Example 2 Facetted Barplot, when run

How to get the js/html or publish an rChart

Now you can add whatever you'd like

```
r1 <- rPlot(mpg ~ wt | am + vs, data = mtcars, type = "point", color = "gear")
r1$print("chart1") # print out the js
r1$save('myPlot.html') #save as html file
r1$publish('myPlot', host = 'gist') # save to gist, rjson required
r1$publish('myPlot', host = 'rpubs') # save to rpubs
```

rCharts has links to several libraries

- We'll do some examples
- Note Ramnath mentions that io2012 and polychart have conflicting js
    - They seem to work for me with that theme, but I get errors if I load the polychart library
    - If debugging with io and polychart, factor that in

morris

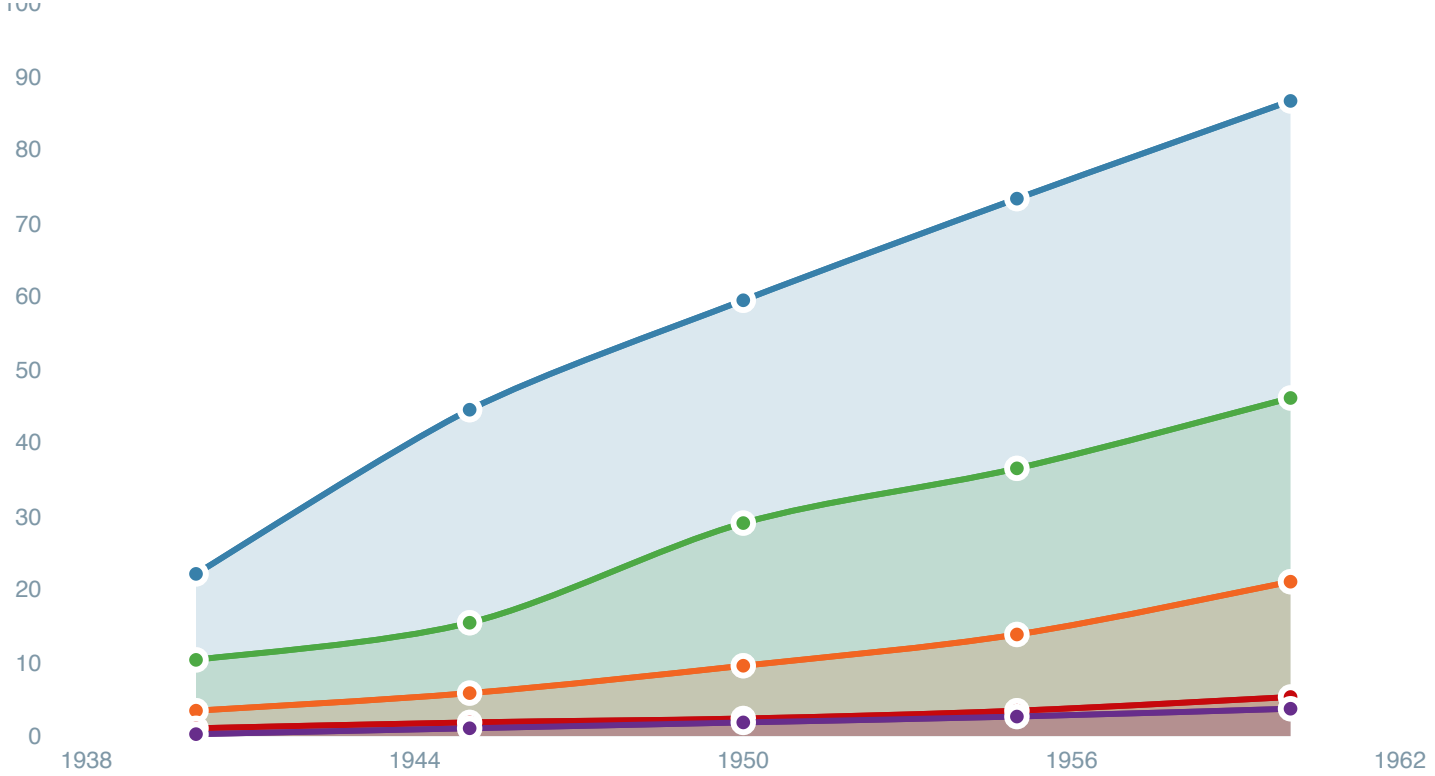
```
data(economics, package = "ggplot2")
econ <- transform(economics, date = as.character(date))
m1 <- mPlot(x = "date", y = c("psavert", "uempmed"), type = "Line", data = econ)
m1$set(pointSize = 0, lineWidth = 1)
m1$save('fig/m1.html', cdn = TRUE)
cat('<iframe src="fig/m1.html" width=100%, height=600></iframe>')
```

morris example run

xCharts

```
require(reshape2)
uspexp <- melt(USPersonalExpenditure)
names(uspexp)[1:2] = c("category", "year")
x1 <- xPlot(value ~ year, group = "category", data = uspexp, type = "line-dotted")
x1$save('fig/x1.html', cdn = TRUE)
cat('<iframe src="fig/x1.html" width=100%, height=600></iframe>')
```

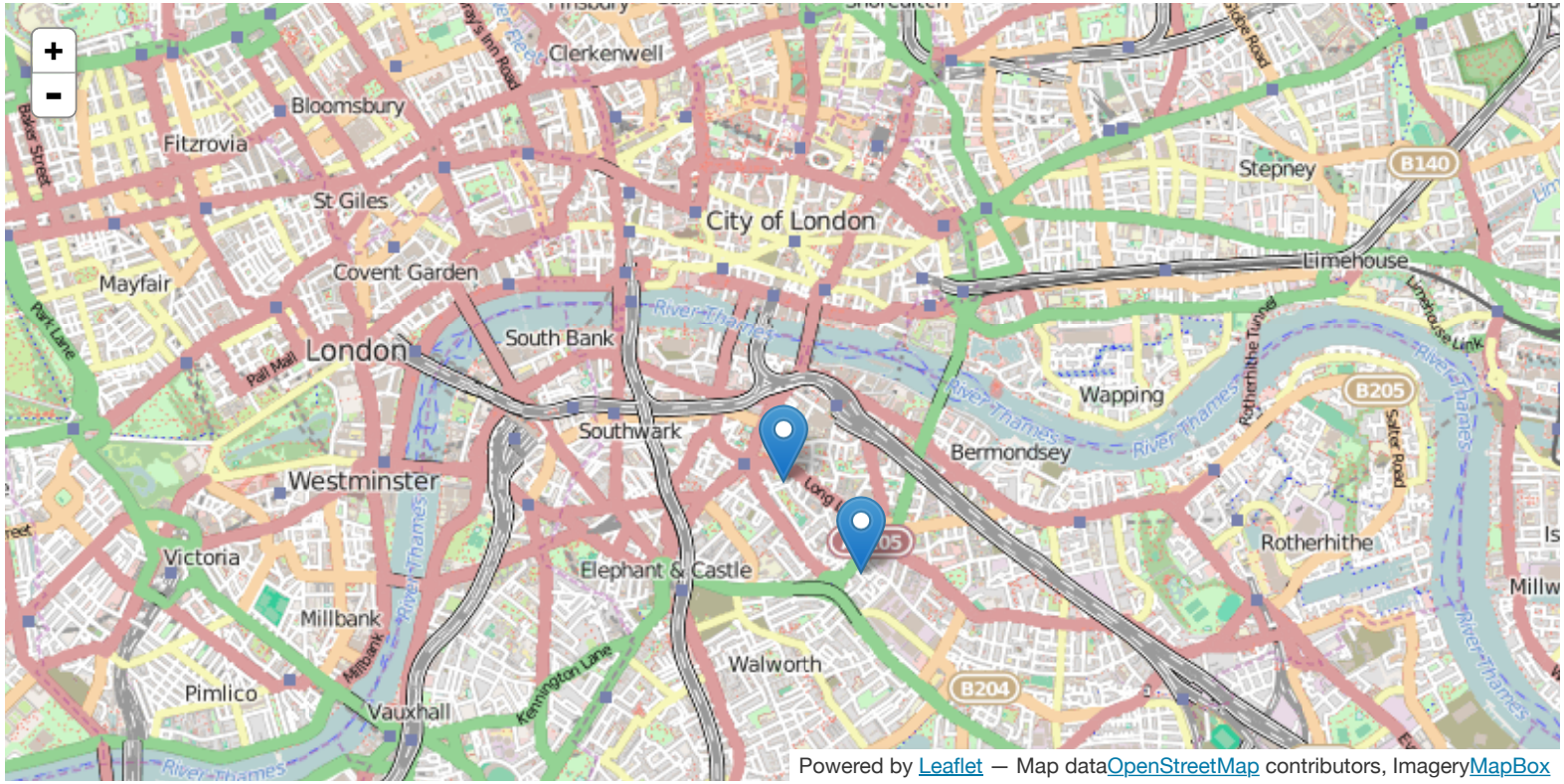
xCharts run



Leaflet

```
map3 <- Leaflet$new()
map3$setView(c(51.505, -0.09), zoom = 13)
map3$marker(c(51.5, -0.09), bindPopup = "<p> Hi. I am a popup </p>")
map3$marker(c(51.495, -0.083), bindPopup = "<p> Hi. I am another popup </p>")
map3$save('fig/map3.html', cdn = TRUE)
cat('<iframe src="fig/map3.html" width=100%, height=600></iframe>')
```

Leaflet run


+
-
Clerkenwell
Bloomsbury
Fitzrovia
St Giles
City of London
Stepney
B140
Limehouse
Mayfair
Covent Garden
South Bank
London
Wapping
B205
Southwark
Bermondsey
Westminster
Victoria
Elephant & Castle
Rotherhithe
Millbank
Walworth
Pimlico
Vauxhall
B204
Powered by Leaflet — Map dataOpenStreetMap contributors, ImageryMapBox

Rickshaw

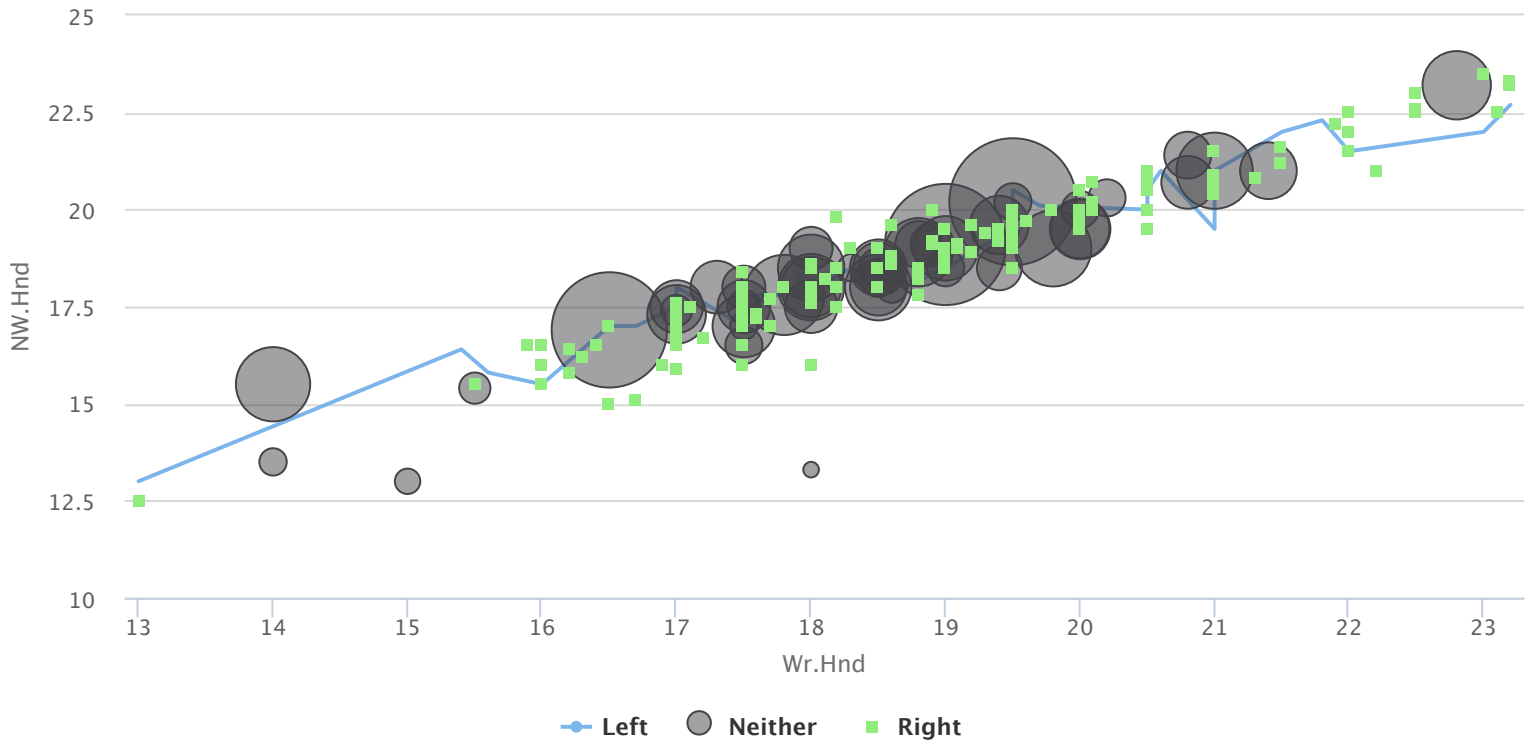
```
usp = reshape2::melt(USPersonalExpenditure)
# get the decades into a date Rickshaw likes
usp$Var2 <- as.numeric(as.POSIXct(paste0(usp$Var2, "-01-01")))
p4 <- Rickshaw$new()
p4$layer(value ~ Var2, group = "Var1", data = usp, type = "area", width = 560)
# add a helpful slider this easily; other features TRUE as a default
p4$set(slider = TRUE)
p4$save('fig/p4.html', cdn = TRUE)
cat('<iframe src="fig/p4.html" width=100%, height=600></iframe>')
```

Rickshaw run

highchart

```
h1 <- hPlot(x = "Wr.Hnd", y = "NW.Hnd", data = MASS::survey, type = c("line",
    "bubble", "scatter"), group = "Clap", size = "Age")
h1$save('fig/h1.html', cdn = TRUE)
cat('<iframe src="fig/h1.html" width=100%, height=600></iframe>')
```

highchart run



rCharts summarized

- rCharts makes creating interactive javascript visualizations in R ridiculously easy
- However, non-trivial customization is going to require knowledge of javascript
- If what you want is not too big of a deviation from the rCharts examples, then it's awesome
    - Otherwise, it's challenging to extend without fairly deep knowledge of the JS libraries that it's calling.
- rCharts is under fairly rapid development