Shiny

Live / Shared / Explored

BARUG May 2013

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Agenda

- Why Shiny?
- First steps in shiny - text and graphics
- Shiny and d3
- Resources

R today

) Excellent statistics platform

) Fabulous graphics

- A personal experience - not a shared one

(Graphics are typically static - manipulated in code, not in the visualisation

(Too slow and memory hungry

(Single threaded

What's Shiny?

- A Webserver for R
- Really simple - no httpd or JS knowledge
- A *Functional Reactive* system
- An application platform
- Addresses some of R's limitations

Getting Started

- `install.packages('shiny')`
- Write your user interface in `ui.R`
- Write your application `server.R`
- `runApp()`
- Test / Debug / Enhance
- Share it with your team or the world

First Demo

always use library(shiny) at the start of ui.R and server.R

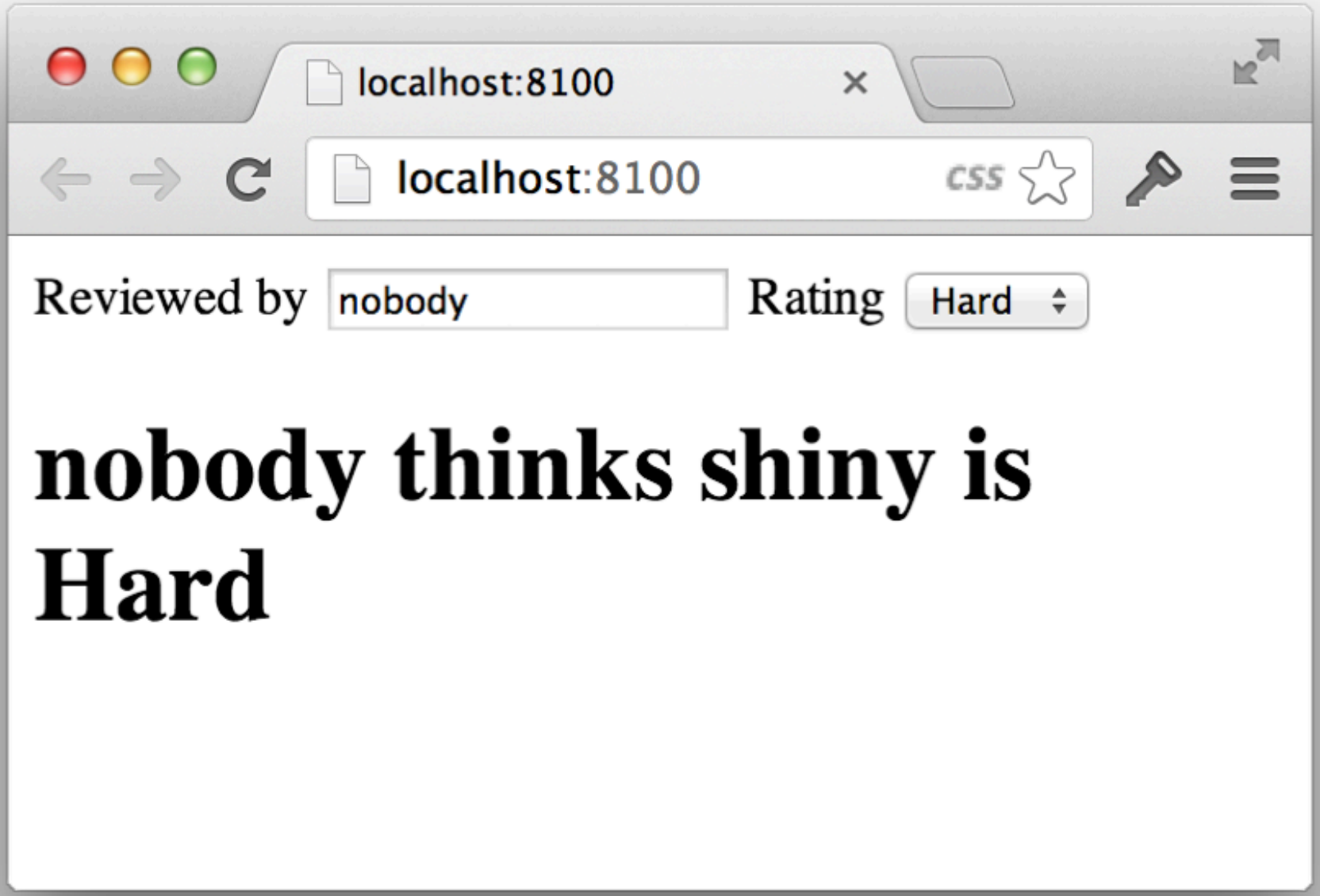
ui.R

```
library(shiny)
shinyUI(
  textInput("who","Reviewed by","nobody"),
  selectInput("rating", "Rating"
              c("Hard","Easy")),
  h1(textOutput("review"))))
```

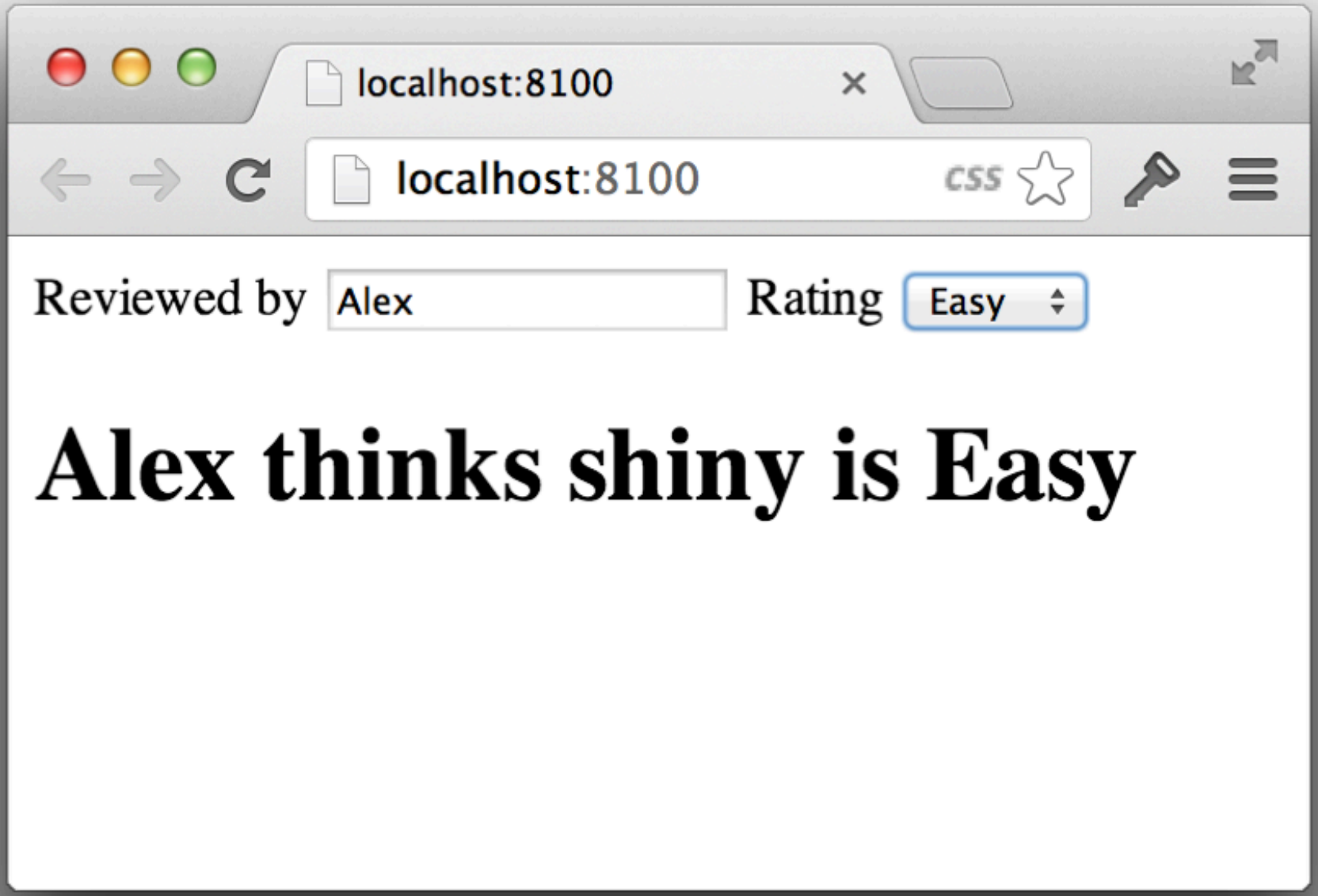
server.R

```
library(shiny)
shinyServer(function(input, output) {
  output$review <- renderText({
    paste(input$who,
      "thinks shiny is", input$rating)
    })
```

First Demo > runApp()



First Demo


localhost:8100
localhost:8100
CSS
Reviewed by
Alex
Rating
Easy
Alex thinks shiny is Easy

First Demo

ui.R

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server.R

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First Demo - Review

- html input "who" is linked to R input$who
- R output$review is linked to html #review
- updates re-evaluate code automatically
- no javascript knowledge required
- this is the Function Reactive Web-server at work

First Plot

Here ggplot2 needs to be 'required' at the start of server.R only.

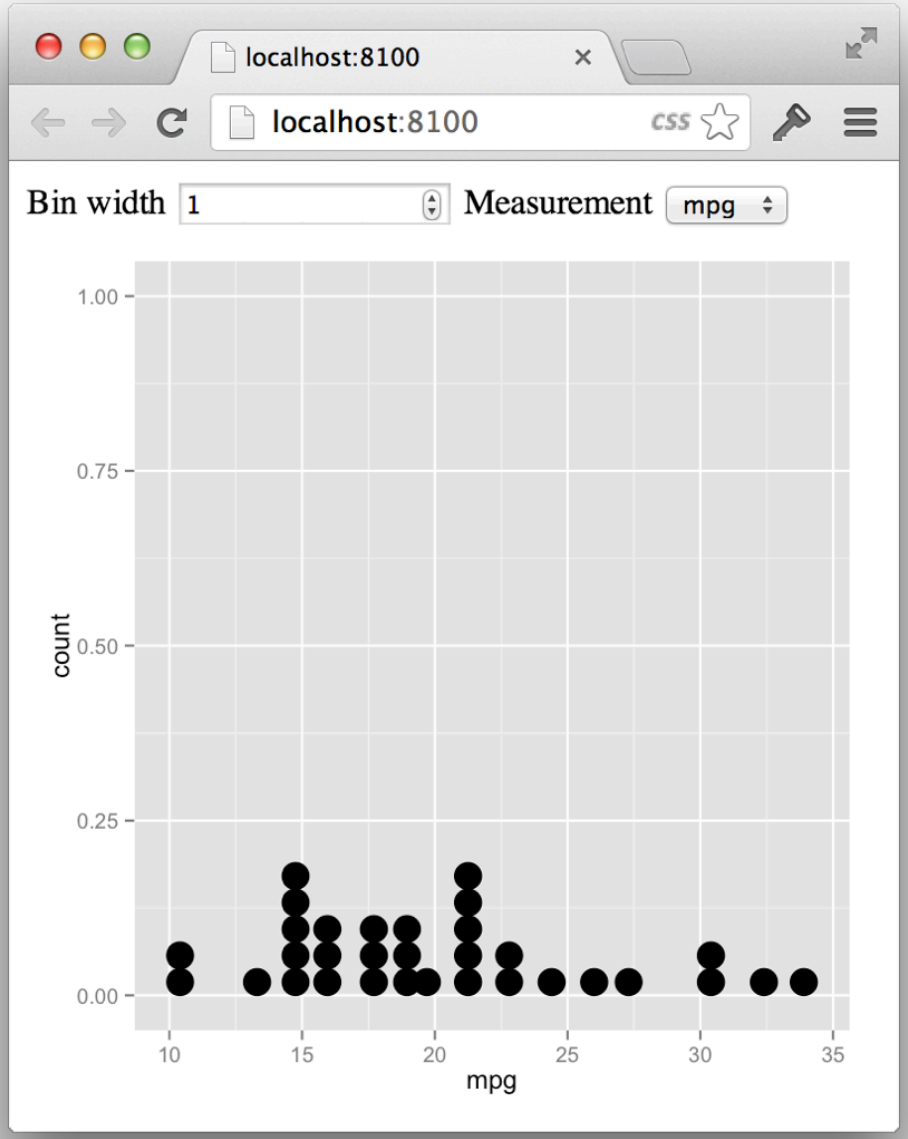
ui.R

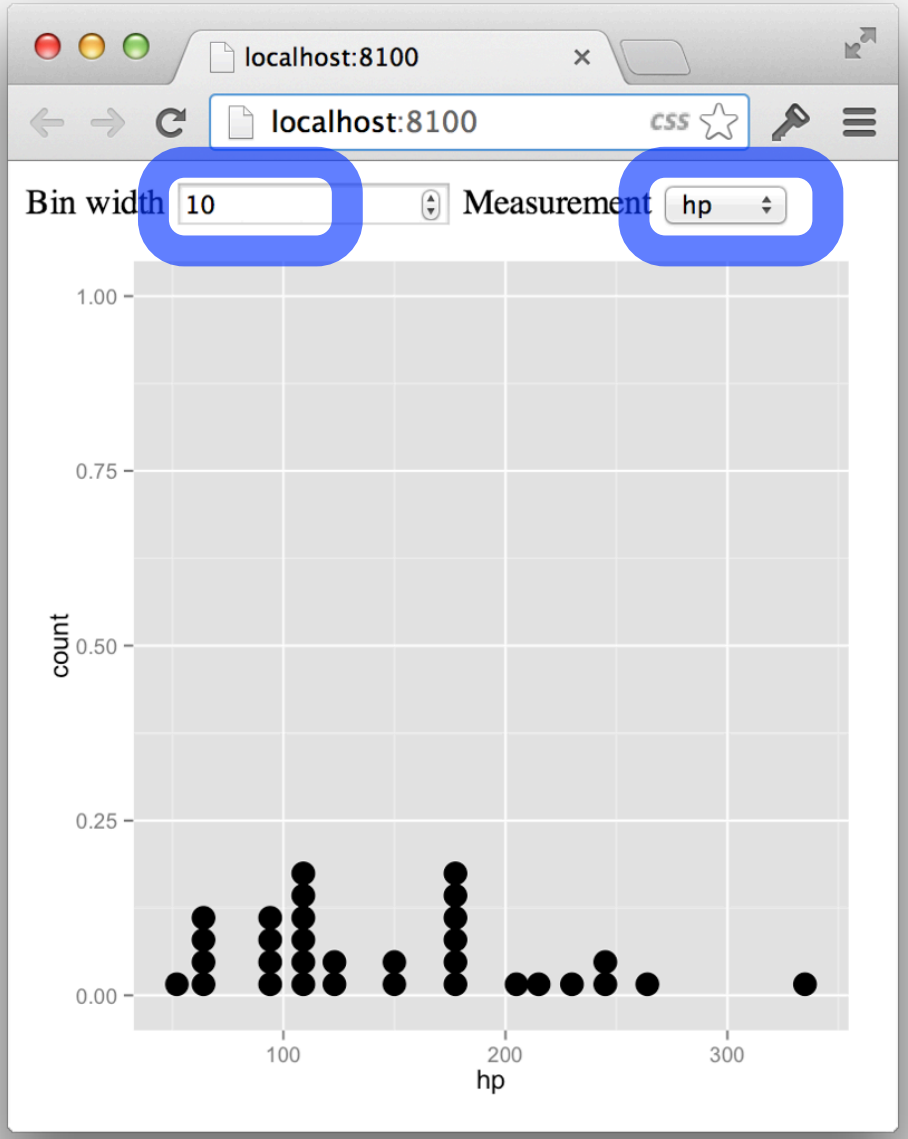
```
shinyUI(div(
  numericInput("binwidth","Bin width",1),
  selectInput("measurement","Measurement",
c("mpg","hp")),
  plotOutput("myplot")))
```

server.R

```
shinyServer(function(input, output) {
  output$myplot <- renderPlot({
 print(ggplot(data=mtcars,
  aes_string(x=input$measurement))+
  geom_dotplot(binwidth=input$binwidth))
})})
```

First Plot > runApp()

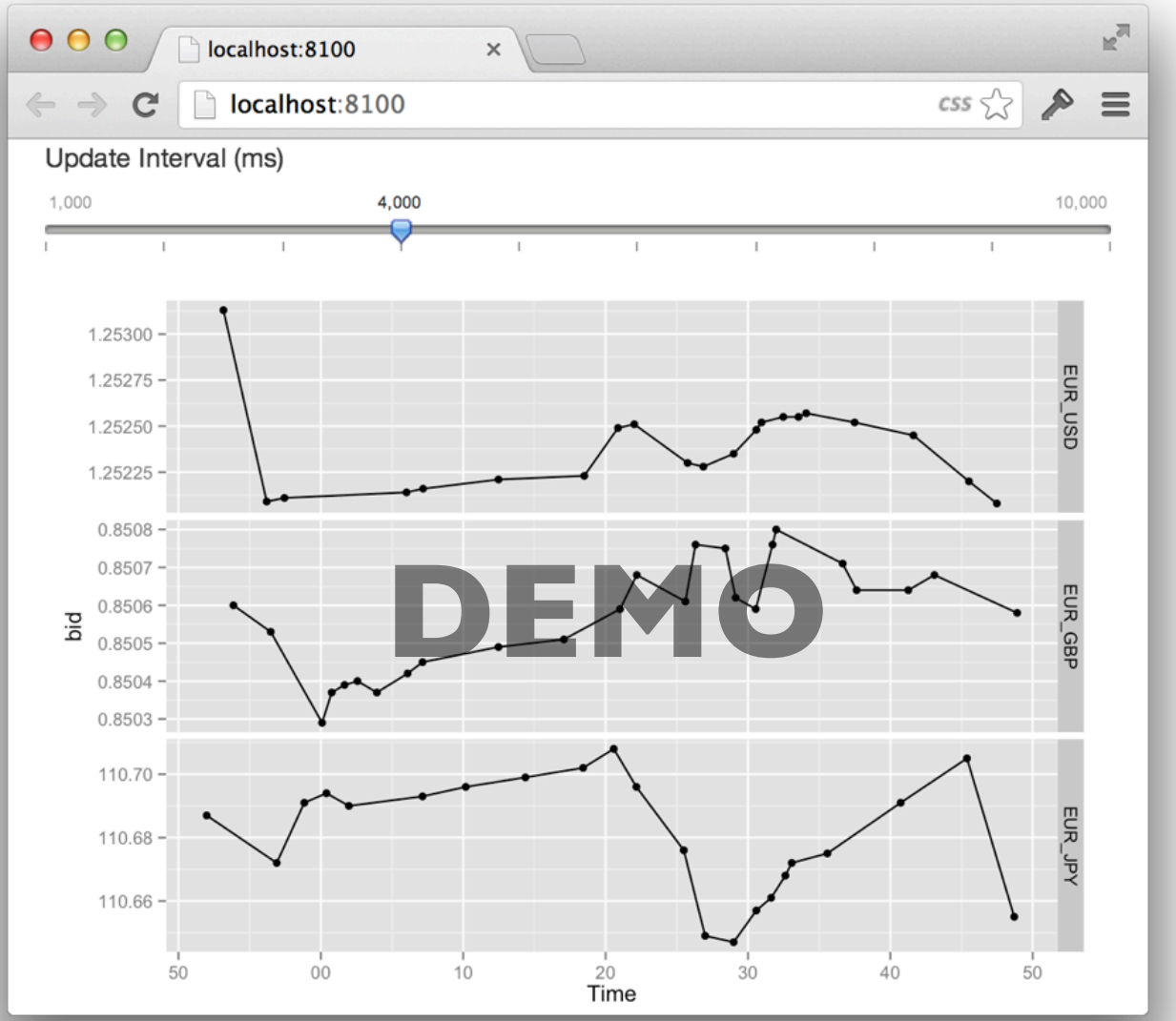




First Plot Review

- Shiny supports all R plot types via 'PNG'
- renderPlot *foo* is linked to plotOutput *#foo*
- *Anything* can be parameterised - numbers, strings, functions, columns, methods, code
- Enables powerful 'exploration' of design parameters for you
- Enables final user to adjust parameters

Live, Shared, Explored



Shiny reports are live because the R is executed every:

session

user

input

...continuously

Live, Shared, Explored

Your reports are shared because:

Your whole team can see the most recent version of the report - just share the URL

Your whole team can get involved in the analysis

You can save and share where you navigated to (* extra work required)

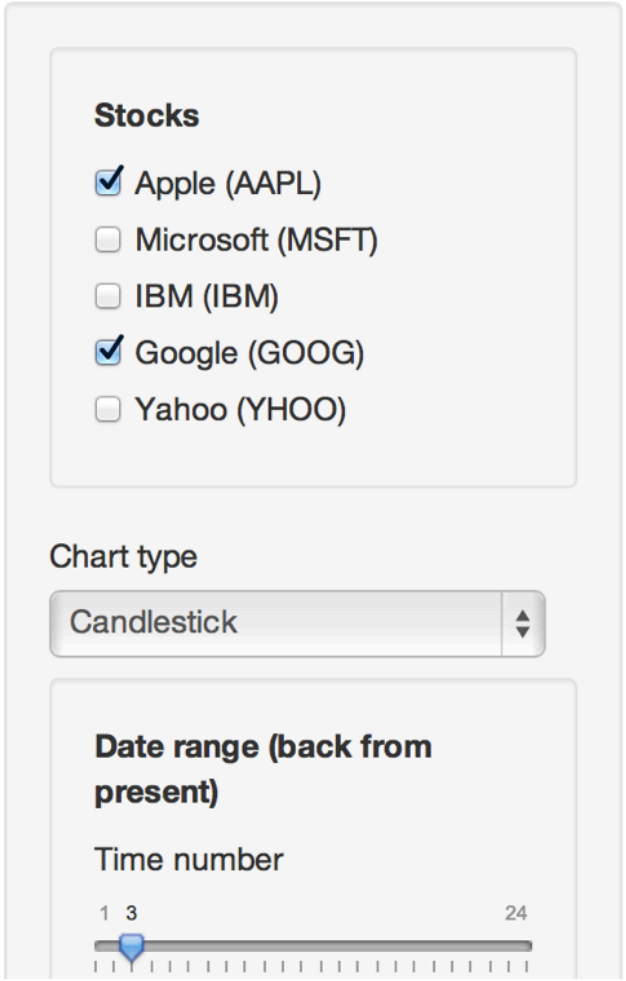
Live, Shared, Explored

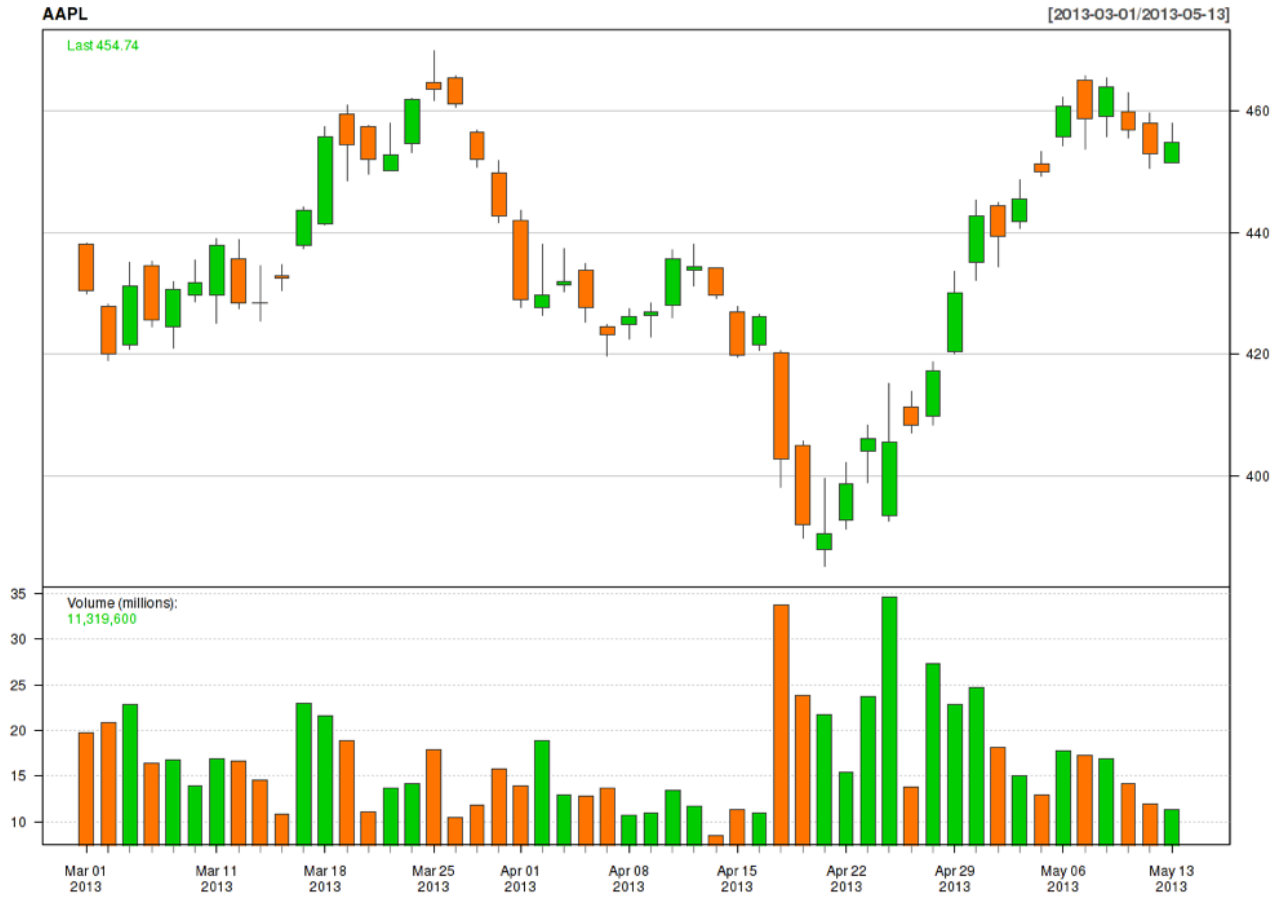
Using tabs to select between datasets, reports and visualisation - each with custom inputs and outputs, you can enable your team to make new discoveries in the data you already have.

Tabs allow whole new sets of inputs and graphs to appear - completely customised in R using `ReactiveUI`

Examples - stocks

- http://glimmer.rstudio.com/winston/stocks/





Making it super-interactive

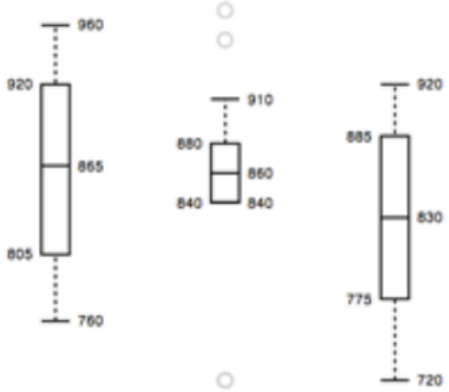
- Shiny has built-in support for PNG output
- Cutting edge web graphs zoomable and clickable - for this we need javascript
- Tools like d3 and googleVis enable this
- Various projects are working on integrating shiny and (d3...) right now

d3 - http://d3js.org

- Javascript library by Mike Bostock of New York Times
- Many, Many visualisation types
- detailed control over output
- Shiny integration (beta):
  - http://ramnathv.github.io/rCharts/r2js/
  - http://glimmer.rstudio.com/alexbbrown/g3plot/

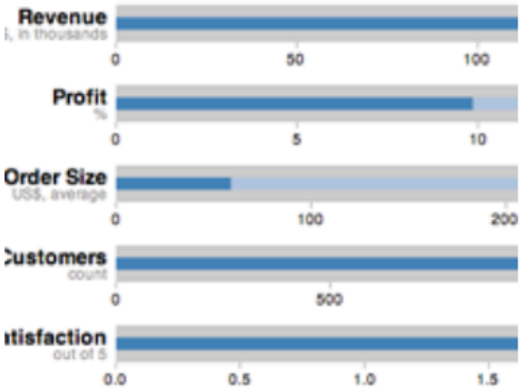
d3 examples

Box Plots



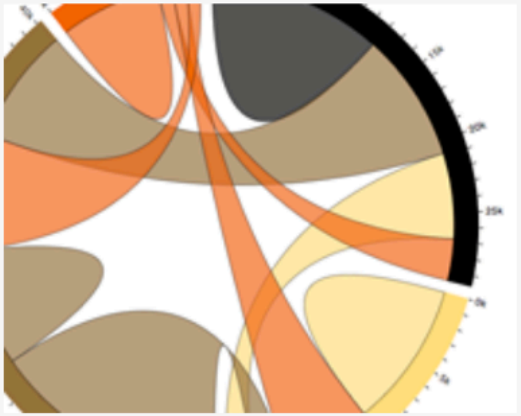
Bubble Chart

Bullet Charts

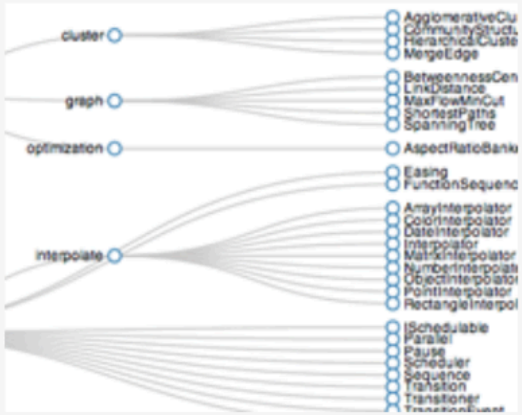


Non-contiguous Cartogram

Chord Diagram



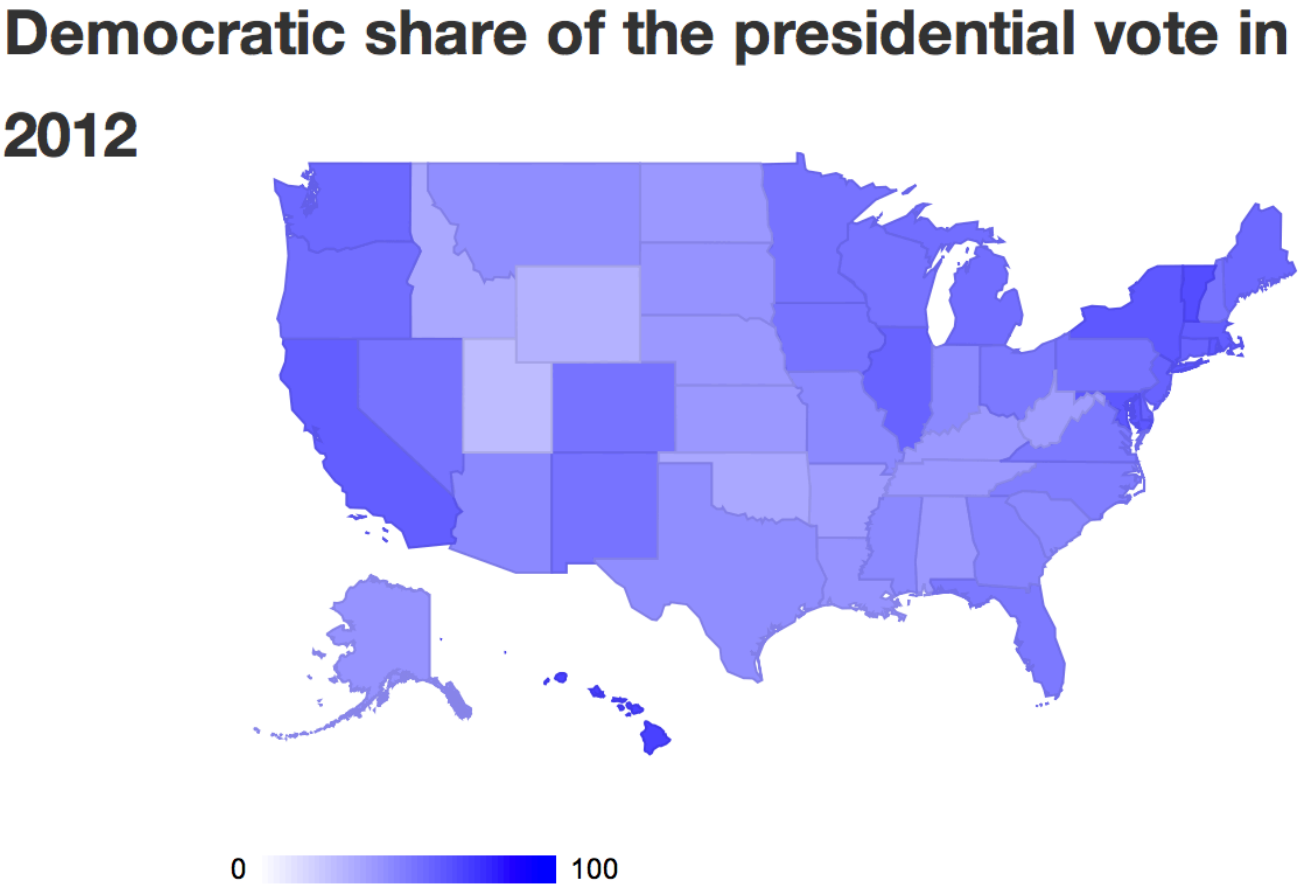
Dendrogram



Google Chart Tools / Google Vis

- Popular JS graphing library
- R package available
- Integration with Shiny (beta)

http://lamages.blogspot.co.uk/2013/02/first-steps-of-using-googlevis-on-shiny.html



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Shiny Resources

- Homepage - http://www.rstudio.com/shiny/
- Tutorial - rstudio.github.io/shiny/tutorial/
- Group - groups.google.com/group/shiny-discuss
- Source - https://github.com/rstudio/shiny/
- Examples - http://ramnathv.github.io/shinyExamples/

Review

- Shiny is easy and powerful
- You can make your analyses Shared, Live, Explorable
- It's going to get more powerful - interactive graphics like d3 are coming
- You can get support from the community and RStudio
- Start coding - and show us what you can achieve

Q&A

- End of presentation