

Tools

Statistics 4868/6610 Data Visualization

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1/20/2016

Introduction

Lets start **visualizing** data!

Software.

The more visualization tools you know how to use and take advantage of, the less likely you'll get stuck not knowing what to do with a dataset and the more likely you can make a graphic that matches your vision.

Introduction

Out-of-the-Box Visualization

- Point-and-Click Software
- MS Excel, Google Docs, Many Eyes, Tableau, SPSS, BlueskyStatistics, SAS

Programming

- processing, processing.js, processing.py
- python, matplotlib
- R, trellis, ggplot2
- SAS

Introduction

Illustration

- Adobe Illustrator
- Inkscape

Mapping

- Google maps, Google earth, Google docs
- yahoo maps and Microsoft maps
- ARCGIS
- Modest Maps, Ploymaps
- tableau, R

Goal

To have an excellent example of a **bubble plot**, **wordcloud**, and a **map** posted online.

Try a software package to modify a graph using that software.

Graduate students make an **animation** using shiny.

Point-and-Click

We start by looking at various point-and-click packages.

MS Excel

Check out [MS Excel 2016](#).

Very nice updates to the Chart Wizard.

Can make maps.

Google Docs and Sheets

Lots of great graphs you can make.

Can make maps.

Can make Bubble plots.

Automatically suggests plots.

Minitab and Minitab Express

Lots of standard graphs.

Can make a bubble plot.

IBM Many Eyes

Was a nice collaborative website. Could make a wordcloud.

Sorry [Many Eyes has been closed](#).

Tableau and Tableau Public

What do you think about tableau?

VisualizeFree

Check out there [website](#).

Interesting blog post

[30 Simple Tools For Data Visualization](#)

IBM SPSS

Very nice chart builder.

[SPSS Visualization Designer](#)

[WatsonAnalytics](#)

Aside: Check out the [Automatic Statistician](#)

SAS

Visual Analytics

[Analytics 2013 - Keynote - Jim Goodnight, SAS](#)

[Jim Goodnight Talks About SAS Visual Analytics: Overview](#)

Programming

Next we will discuss programming Tools.

Python

Python is a very flexible programming language that can be used to interact with data on the internet easily.

- [python](#)
- [matplotlib](#)
- [plotly](#)

Check out

- [DataJoy](#)
- [Wakari](#)

Processing

This is a programming language used for creating animated and interactive graphics.

- [Processing](#)
- [Processing.js](#)
- [Processing.py](#)

Protovis

A graphical approach to visualization. [Protovis](#) development has ended. The developers are now working on [D3.js](#).

The [misoproject](#) looks to be a next step.

R

[R](#) is an excellent programming environment for developing visualizations. The basic graphics are very configurable. There are many libraries that add additional graphics.

- [Trellis](#)
- [Stat 787](#)
- [Lattice](#)
- [Getting Started with Lattice](#)
- [ggplot2](#)
- [R Graphics](#) this is an excellent book.
- [plotly](#)

RStudio and shiny

- [RStuido](#) has added a lot to making R more useful.
- [shiny](#) is an add-on to R, produced by the developers of RStuido, that is useful for making visual animations with data.

Alternatively, check out

- [DataJoy](#)

Mapping

Traditional mapping software now on the cloud.

- [ARCGIS](#)
- [ARCGIS Gallery](#)

Check out

- [mapzen](#)

Data

- [Quandl](#)

There is an R library Quandl [Quandl R App](#)

Get an account to access the data from within R.

Slide With R Code

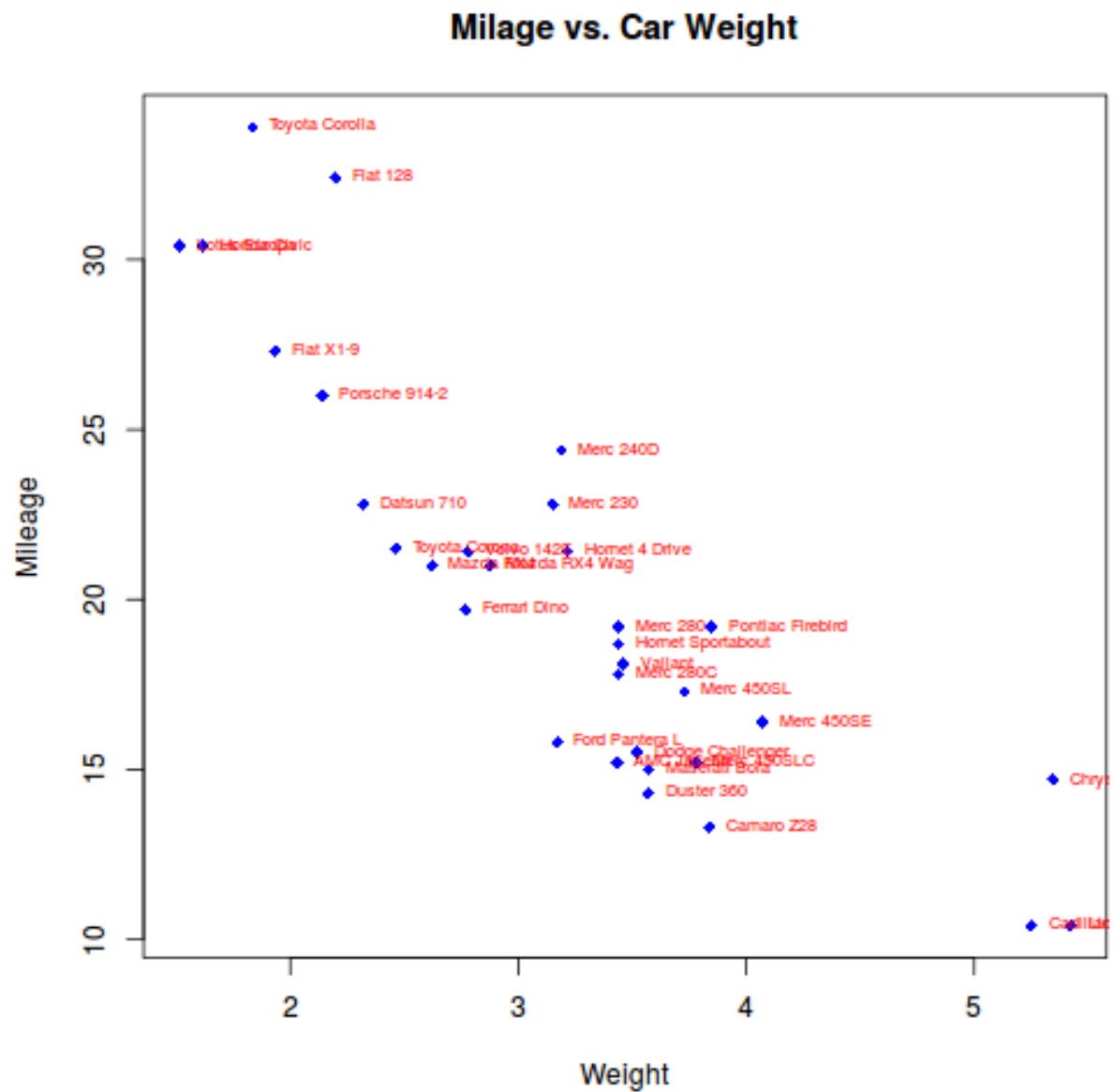
From the [Quick-R](#) website.

[Advanced Graphs](#)

[Axes and Text](#)

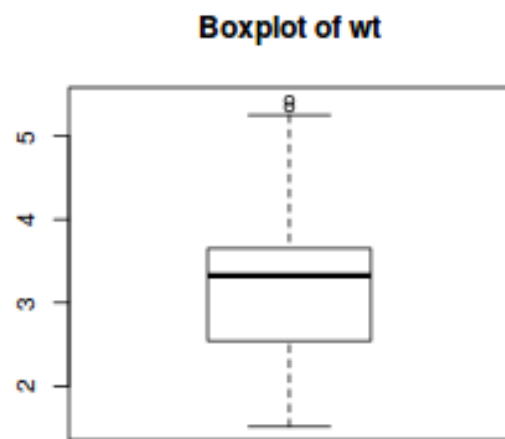
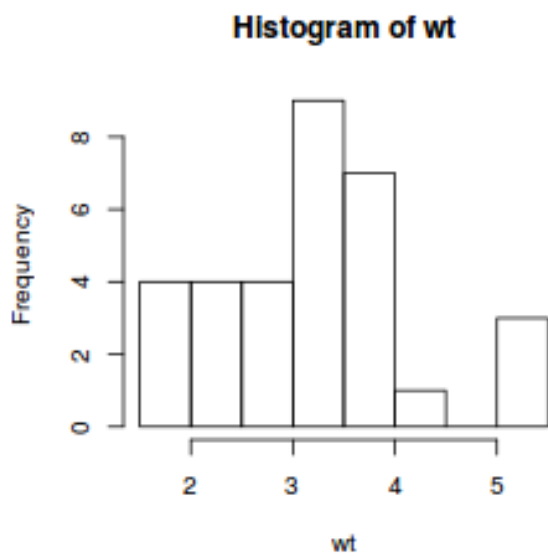
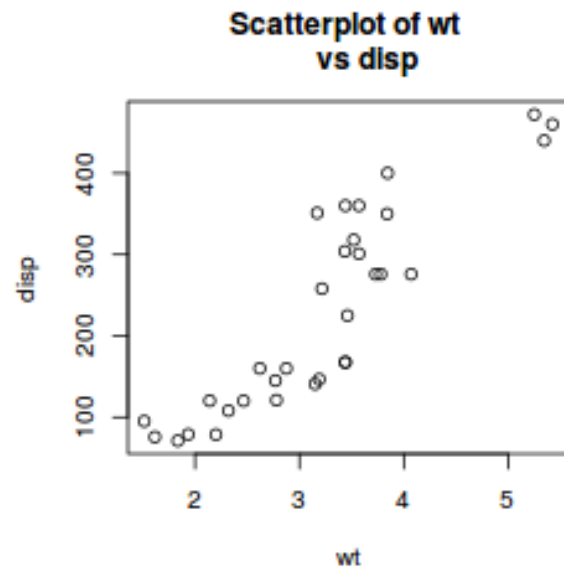
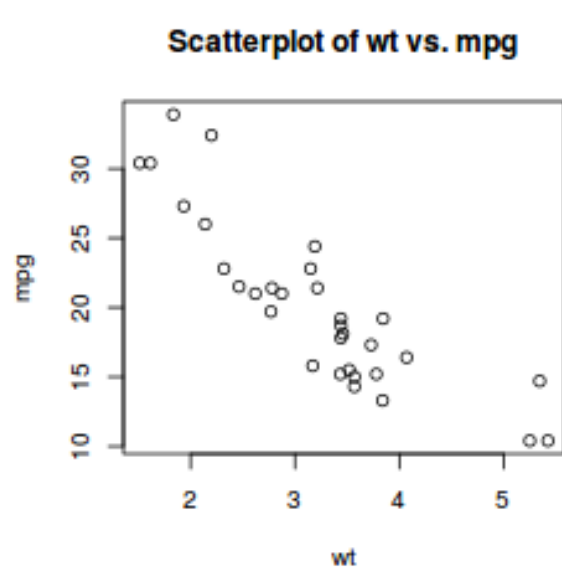
```
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# Example of labeling points
attach(mtcars)
plot(wt, mpg, main="Milage vs. Car Weight",
      xlab="Weight", ylab="Mileage", pch=18,
      col="blue")
text(wt, mpg, row.names(mtcars), cex=0.6,
      pos=4, col="red")
```



Combining Plots

```
# 4 figures arranged in 2 rows and 2 columns
attach(mtcars)
par(mfrow=c(2,2))
plot(wt,mpg, main="Scatterplot of wt vs. mpg")
plot(wt,disp, main="Scatterplot of wt
      vs disp")
hist(wt, main="Histogram of wt")
boxplot(wt, main="Boxplot of wt")
```



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Try all of the code on this webpage from Quick R.

[Lattice](#)