

Data visualization in R

Basic graphics

In this lecture

- Basic graphics
 - Scatter
 - Line
 - Bar
- Need for sophisticated graphics

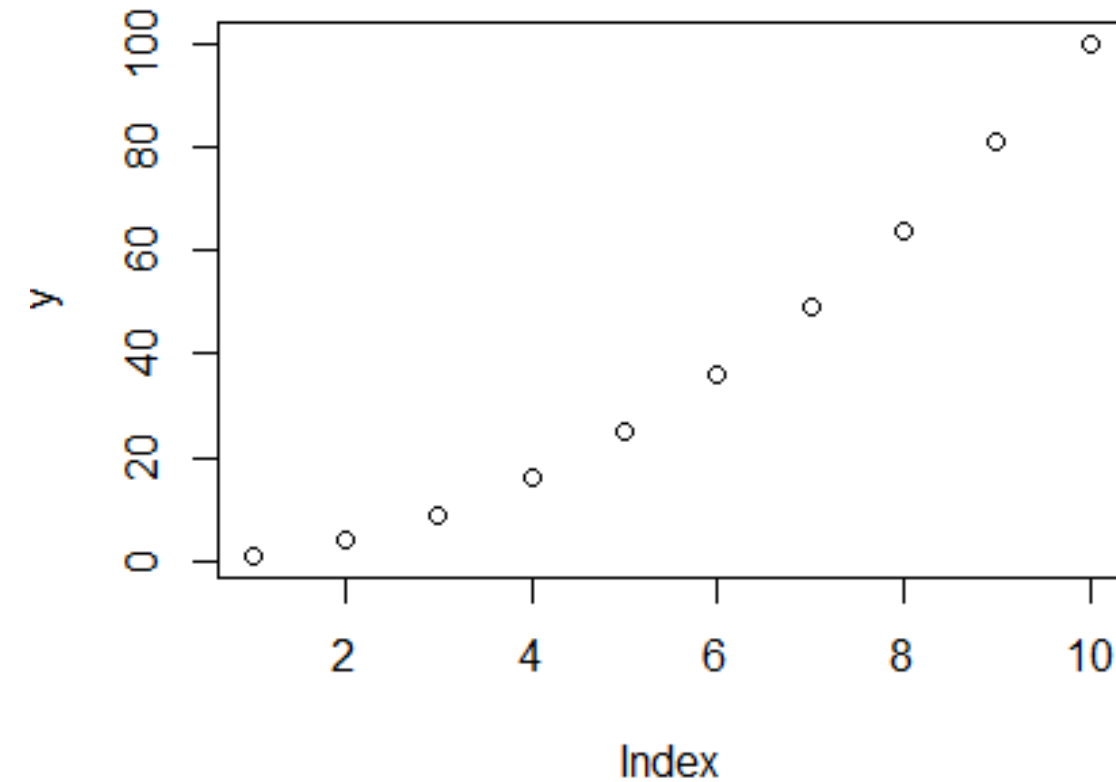
Scatter plot

R – code:

X = 1:10

Y = X^2

plot (Y)



Scatter plot

dataset 'mtcars':

The data was extracted from the 1974 *Motor Trend* US magazine, and comprises fuel consumption and 10 aspects of automobile design and performance for 32 automobiles (1973–74 models).

Usage

`mtcars`

Format

A data frame with 32 observations on 11 variables.

```
[, 1] mpg Miles/(US) gallon
[, 2] cyl Number of cylinders
[, 3] disp Displacement (cu.in.)
[, 4] hp Gross horsepower
[, 5] drat Rear axle ratio
[, 6] wt Weight (1000 lbs)
[, 7] qsec 1/4 mile time
[, 8] vs V/S
[, 9] am Transmission (0 = automatic, 1 = manual)
[,10] gear Number of forward gears
[,11] carb Number of carburetors
```

Source

Henderson and Velleman (1981), Building multiple regression models interactively. *Biometrics*, **37**, 391–411.

Scatter plot

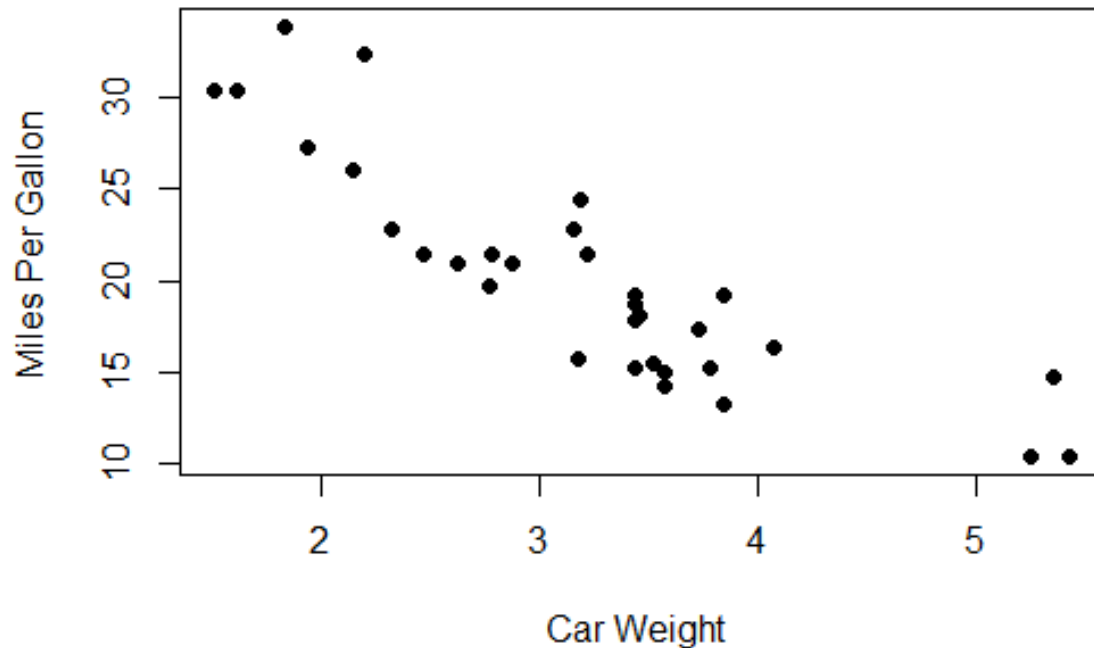
R – code :

```
plot( mtcars$wt, mtcars$mpg ,
      main="Scatterplot Example",
      xlab="Car Weight ", ylab="Miles Per Gallon ", pch=19)
```

Corresponds to different shapes
for points, for more such
options check 'graphics
parameters' in help



Scatterplot Example



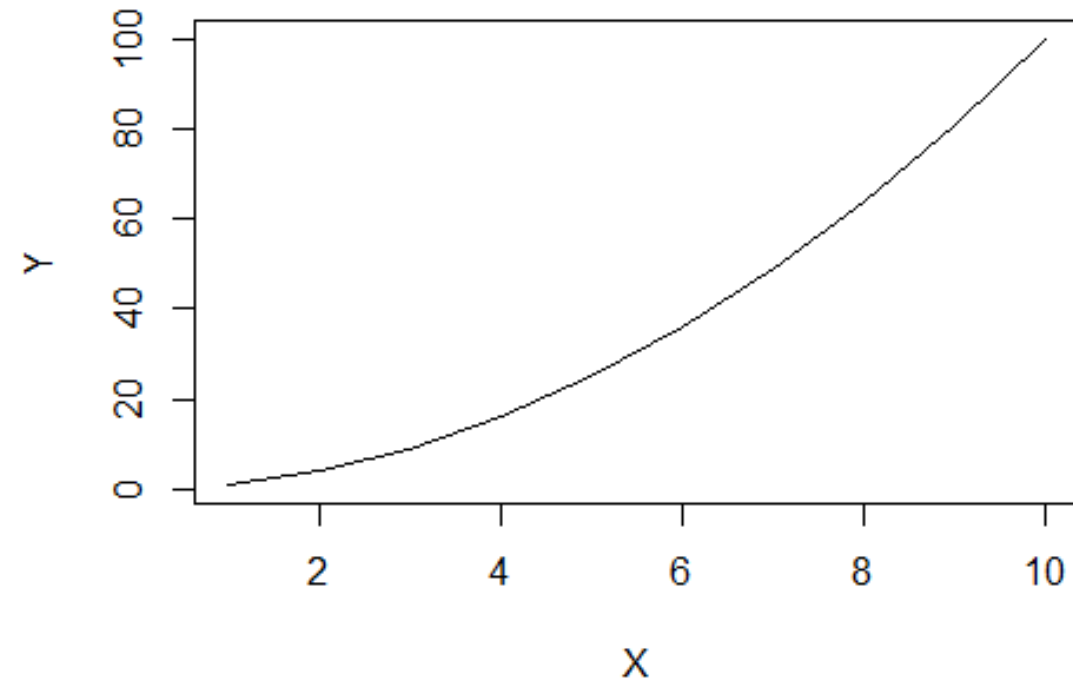
Line plot

R – code :

`X = 1:10`

`Y = X^2`

`plot(X, Y, type = 'l')`



Bar plot

Syntax:

```
barplot(H, names.arg, xlab, ylab, main, names.arg, col)
```

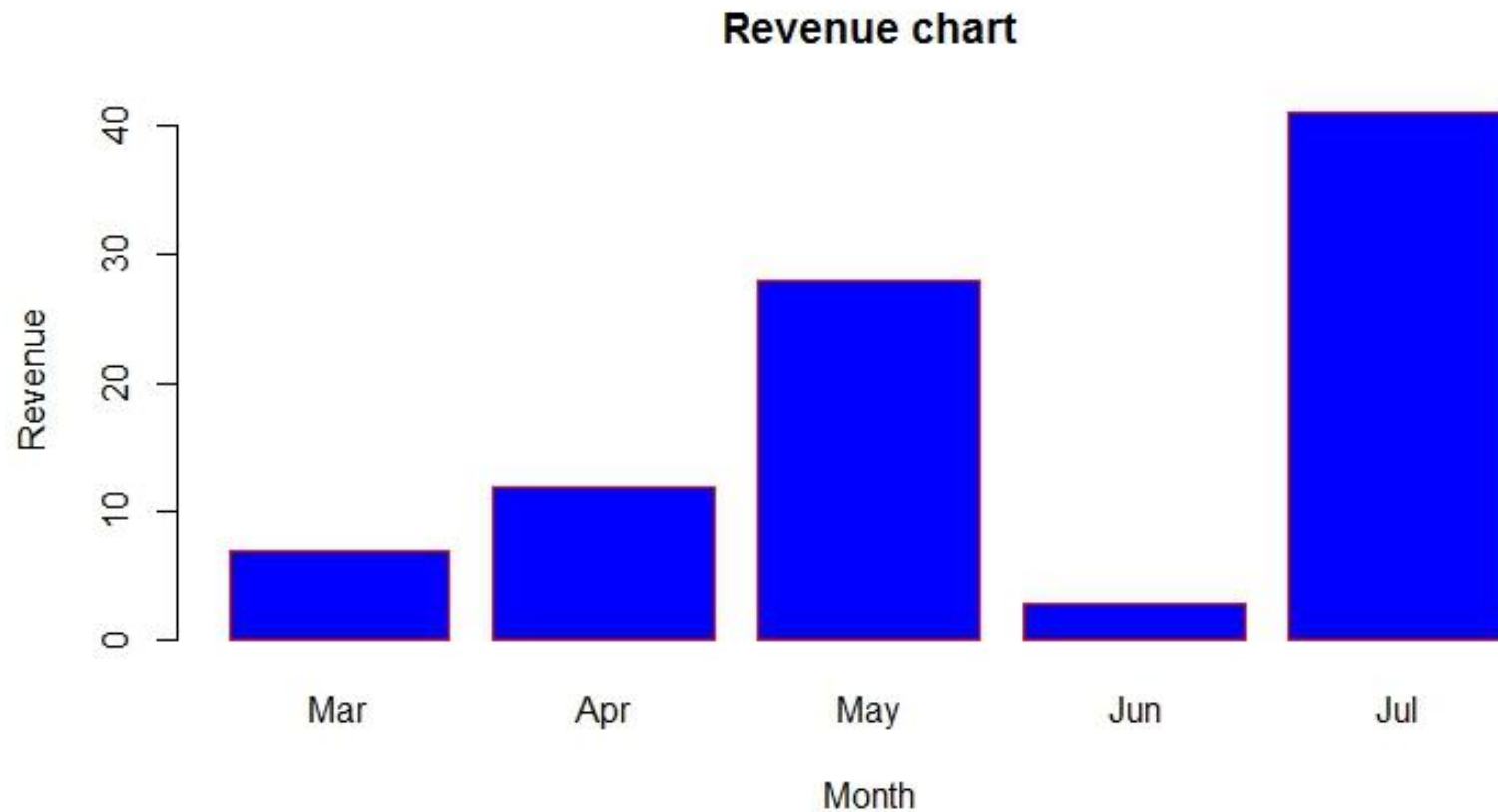
R – code :

```
H <- c(7,12,28,3,41)
```

```
M <- c("Mar","Apr","May","Jun","Jul")
```

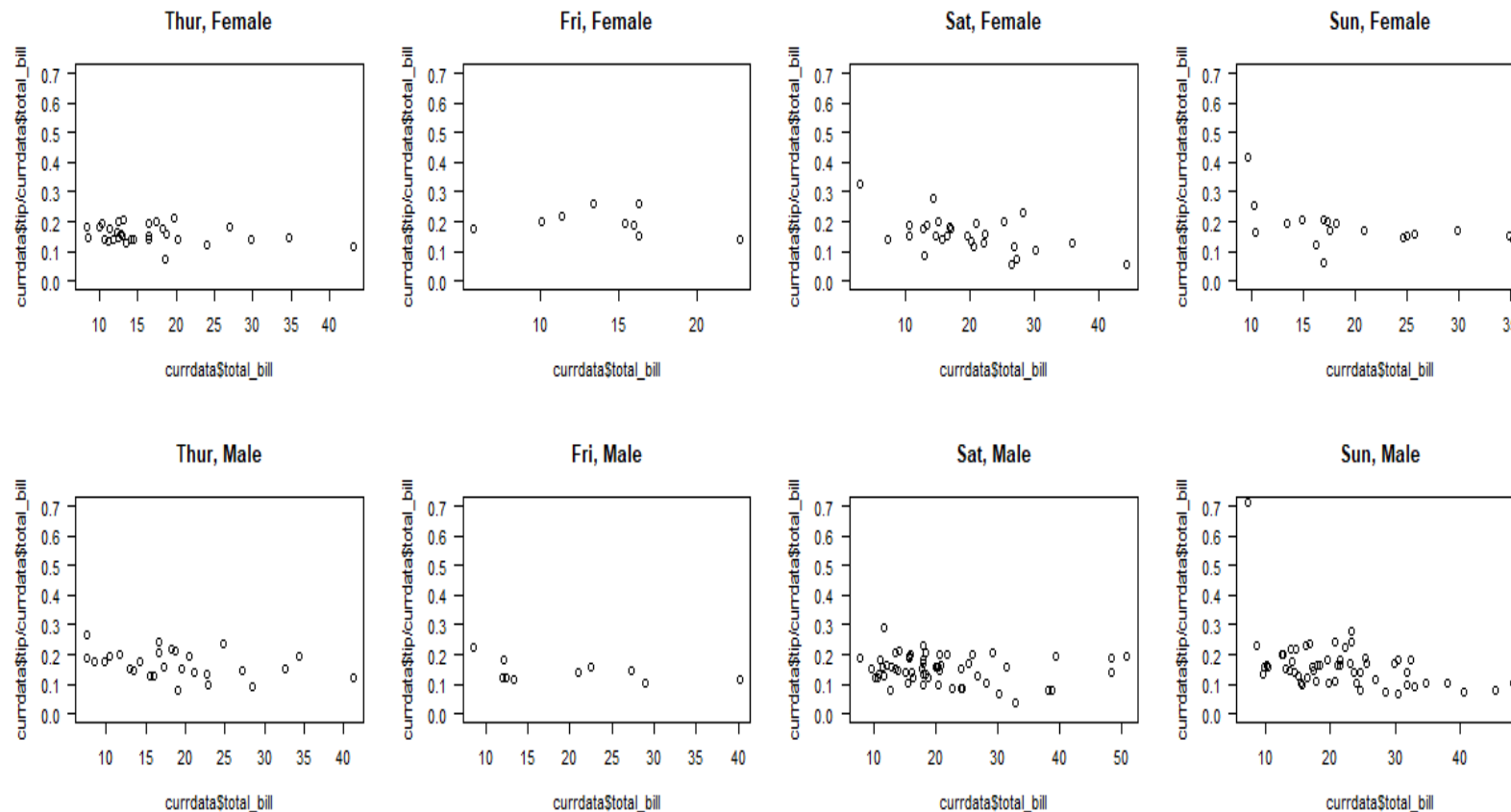
```
barplot(H,names.arg = M, xlab = "Month", ylab = "Revenue",  
col = "blue", main = "Revenue chart",border = "red")
```

Bar plot



Need for sophisticated graphics

Lets us say there is a need for you to show multiple plots in a single figure such as the following:



Challenges

The exact figure as per the previous slide can be reproduced with the following code:

```
par(mfrow=c(2,4))
days <- c("Thur", "Fri", "Sat", "Sun")
sexes <- unique(tips$sex)
for (i in 1:length(sexes)) {
  for (j in 1:length(days)) {
    currdata <- tips[tips$day == days[j] & tips$sex == sexes[i],]
    plot(currdata$total_bill, currdata$tip/currdata$total_bill,
         main=paste(days[j], sexes[i], sep=", "), ylim=c(0,0.7), las=1)
  }
}
```

Challenges

But the code requires work such as :

- *Knowing when to introduce a for loop*
- *Which columns of the data.frame to select*
- *The positioning of each graph in the grid etc*
- *Less pleasing visuals*

Summary

- 1) Scatter plots
- 2) Line plots
- 3) Bar plots
- 4) Challenges and disadvantages of basic graphics