Introduction to R

Pramod Duvvuri

4/9/2019

```
### vectors, data, matrices, subsetting
x=c(2,7,5)
x
```

```
## [1] 2 7 5
```

```
y=seq(from=4,length=3,by=3)
?seq
y
```

```
## [1]  4  7 10
```

```
x+y
```

```
## [1]  6 14 15
```

```
x/y
```

```
## [1] 0.5 1.0 0.5
```

```
x^y
```

```
## [1]      16  823543 9765625
```

```
x[2]
```

```
## [1] 7
```

```
x[2:3]
```

```
## [1] 7 5
```

```
x[-2]
```

```
## [1] 2 5
```

```
x[-c(1,2)]
```

```
## [1] 5
```

```
z=matrix(seq(1,12),4,3)
z
```

```
##      [,1] [,2] [,3]
## [1,]    1    5    9
## [2,]    2    6   10
## [3,]    3    7   11
## [4,]    4    8   12
```

```
z[3:4,2:3]
```

```
##      [,1] [,2]
## [1,]    7   11
## [2,]    8   12
```

```r
z[,2:3]
```

```
##      [,1] [,2]
## [1,]    5    9
## [2,]    6   10
## [3,]    7   11
## [4,]    8   12
```

```r
z[,1]
```

```
## [1] 1 2 3 4
```

```r
z[,1,drop=FALSE]
```

```
##      [,1]
## [1,]    1
## [2,]    2
## [3,]    3
## [4,]    4
```

```r
dim(z)
```

```
## [1] 4 3
```

```r
ls()
```
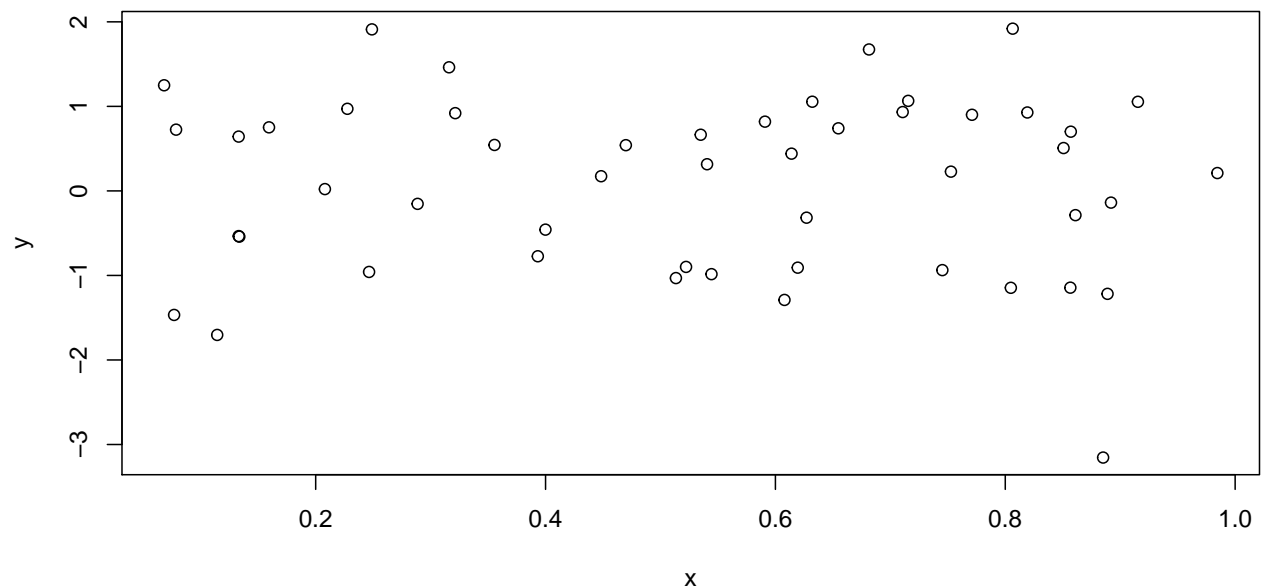
```
## [1] "x" "y" "z"
```

```r
rm(y)
ls()
```

```
## [1] "x" "z"
```
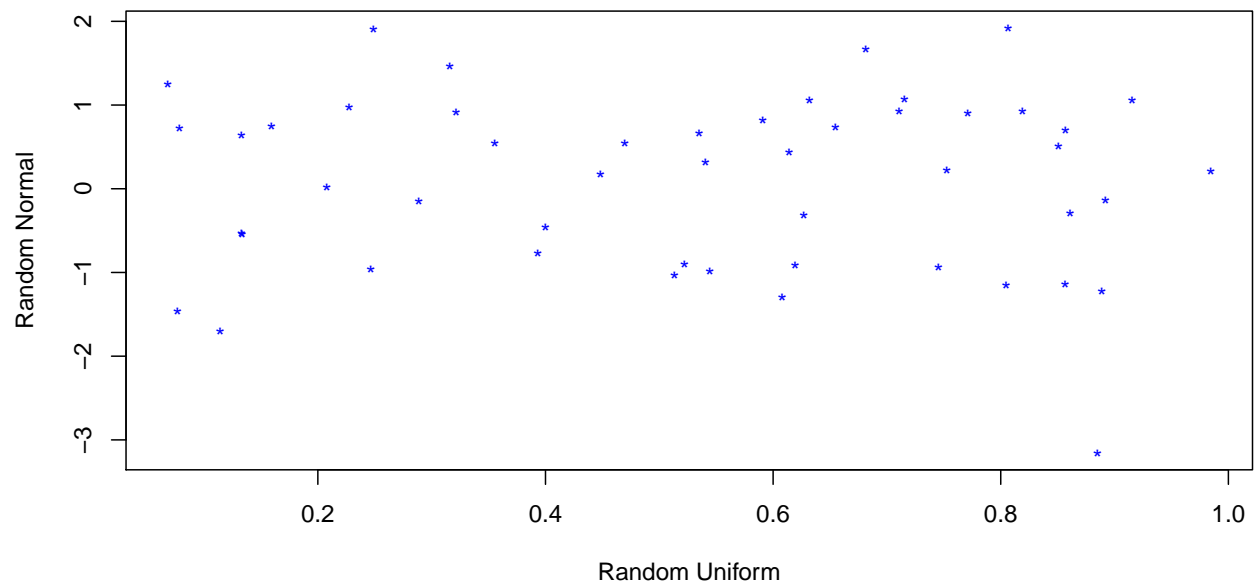
```r
### Generating random data, graphics
x=runif(50)
y=rnorm(50)
plot(x,y)
```
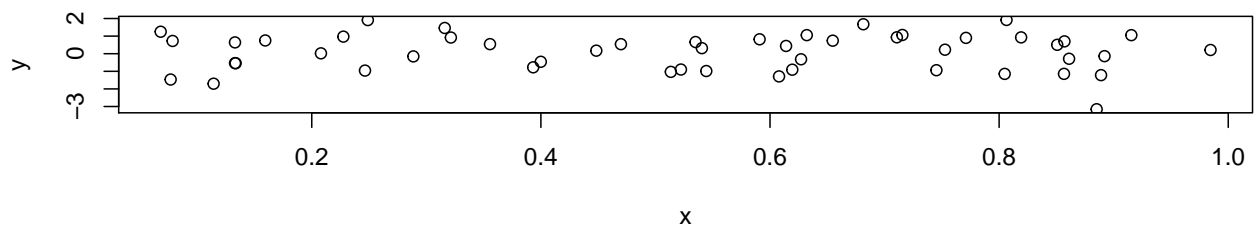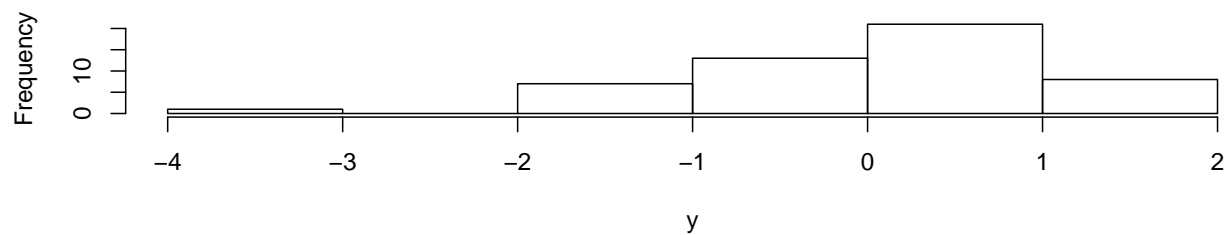


```r
plot(x,y,xlab="Random Uniform",ylab="Random Normal",pch="*",col="blue")
```

```r
par(mfrow=c(2,1))
plot(x,y)
hist(y)
```


Histogram of y


```r
par(mfrow=c(1,1))
```

```r
### Reading in data
library(ISLR)
# Auto=read.csv("Auto.csv")
# pwd()
# Auto=read.csv("../Auto.csv")
data(Auto)
names(Auto)
```

```
## [1] "mpg"          "cylinders"    "displacement" "horsepower"
## [5] "weight"       "acceleration" "year"         "origin"
## [9] "name"
```

```r
dim(Auto)
```

```
## [1] 392   9
```

```r
class(Auto)
```

```
## [1] "data.frame"
```

```r
summary(Auto)
```

```
##       mpg          cylinders      displacement     horsepower
##  Min.   : 9.00   Min.   :3.000   Min.   : 68.0   Min.   : 46.0
##  1st Qu.:17.00   1st Qu.:4.000   1st Qu.:105.0   1st Qu.: 75.0
##  Median :22.75   Median :4.000   Median :151.0   Median : 93.5
##  Mean   :23.45   Mean   :5.472   Mean   :194.4   Mean   :104.5
##  3rd Qu.:29.00   3rd Qu.:8.000   3rd Qu.:275.8   3rd Qu.:126.0
##  Max.   :46.60   Max.   :8.000   Max.   :455.0   Max.   :230.0
##
##      weight       acceleration        year          origin
##  Min.   :1613   Min.   : 8.00   Min.   :70.00   Min.   :1.000
##  1st Qu.:2225   1st Qu.:13.78   1st Qu.:73.00   1st Qu.:1.000
##  Median :2804   Median :15.50   Median :76.00   Median :1.000
##  Mean   :2978   Mean   :15.54   Mean   :75.98   Mean   :1.577
##  3rd Qu.:3615   3rd Qu.:17.02   3rd Qu.:79.00   3rd Qu.:2.000
##  Max.   :5140   Max.   :24.80   Max.   :82.00   Max.   :3.000
##
##                  name
##  amc matador       :  5
##  ford pinto        :  5
##  toyota corolla    :  5
##  amc gremlin       :  4
##  amc hornet        :  4
##  chevrolet chevette:  4
##  (Other)           :365
```
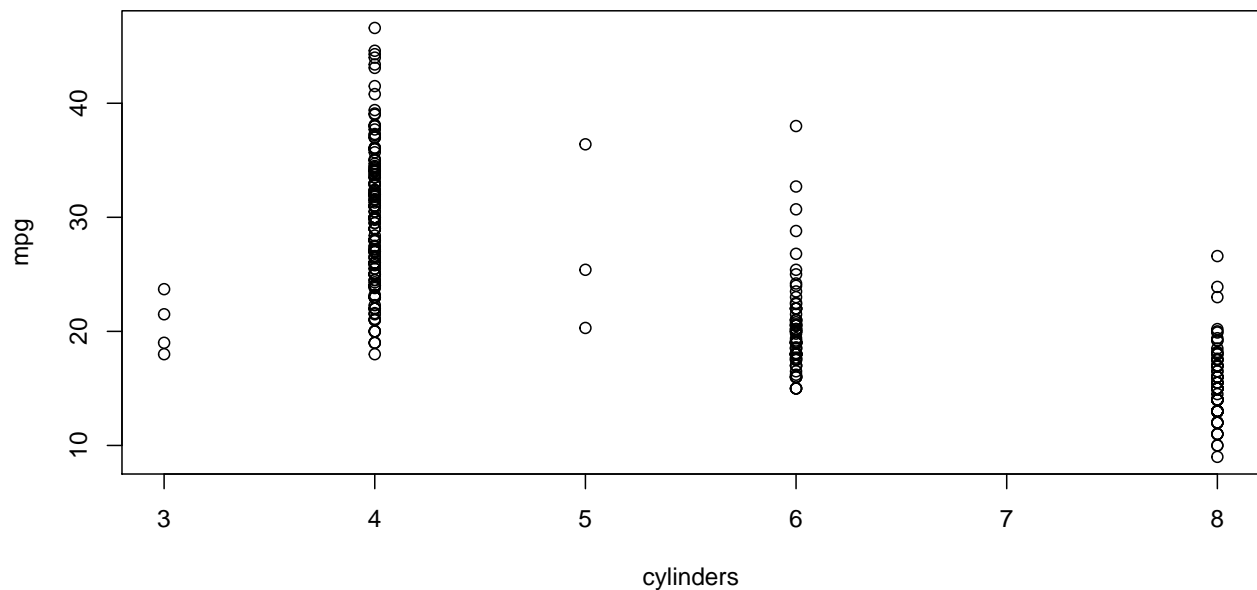
```r
plot(Auto$cylinders,Auto$mpg)
```
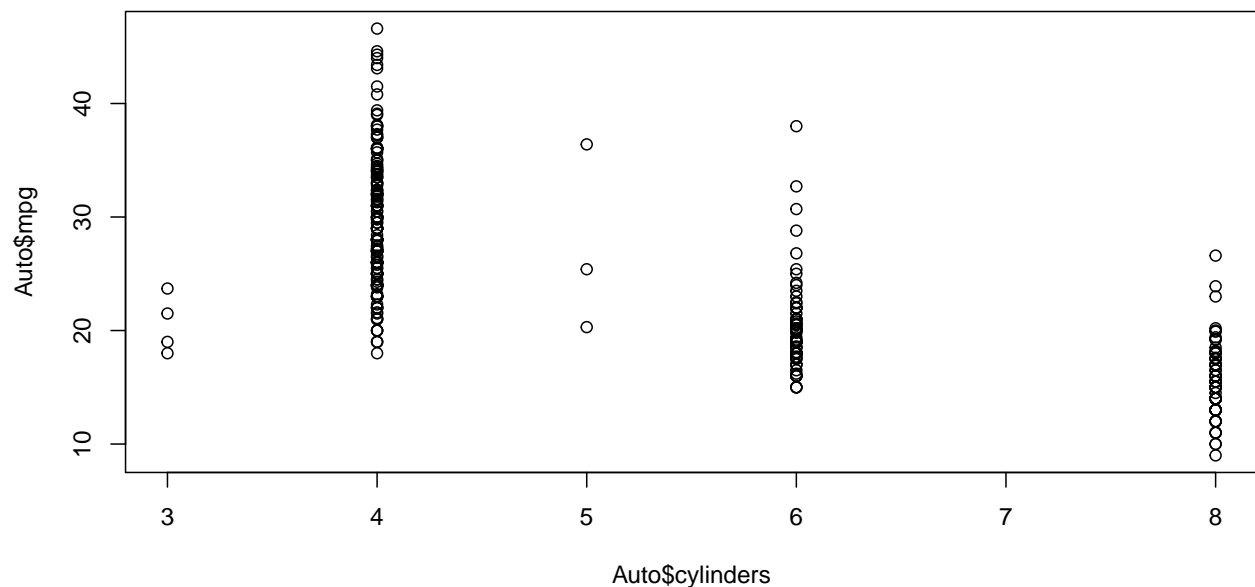
```r
plot(Auto$cyl,Auto$mpg)
```
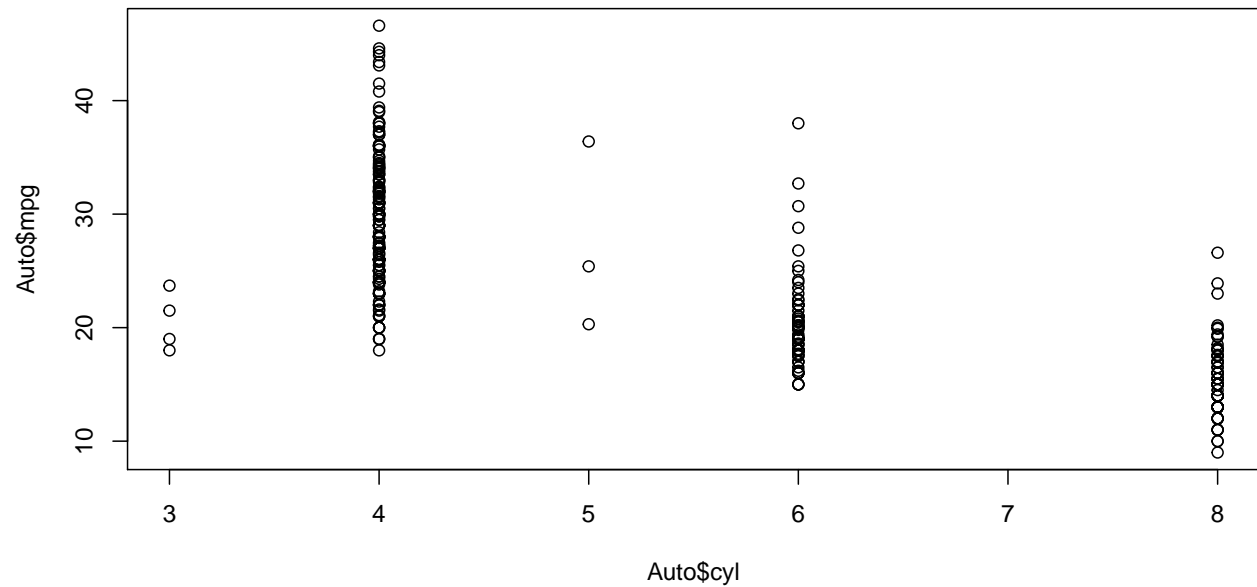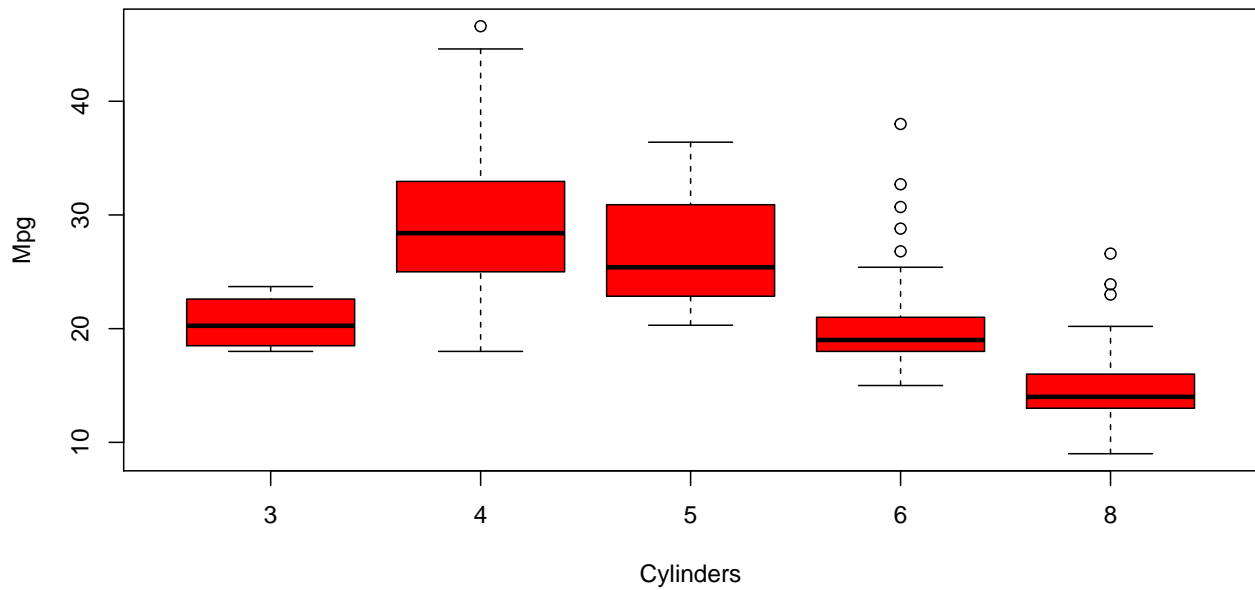


```r
attach(Auto)
search()
```

```
##  [1] ".GlobalEnv"        "Auto"              "package:ISLR"
##  [4] "package:stats"     "package:graphics"  "package:grDevices"
##  [7] "package:utils"     "package:datasets"  "package:methods"
## [10] "Autoloads"         "package:base"
```
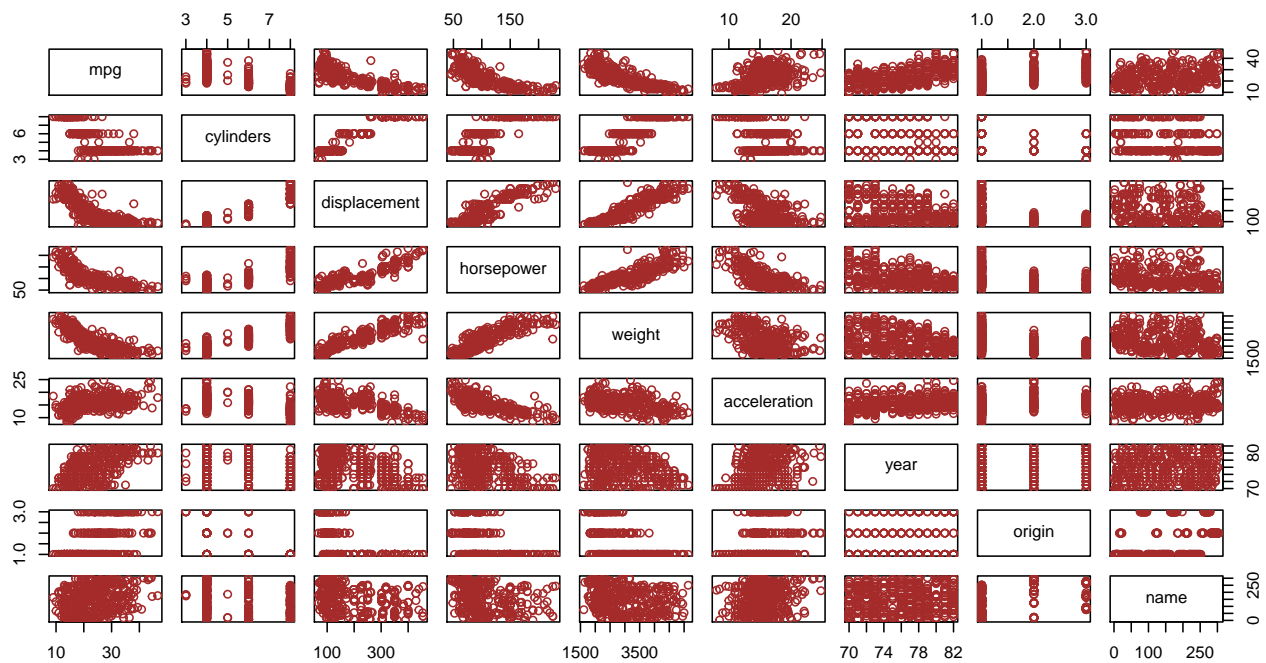
```r
plot(cylinders,mpg)
```



```r
cylinders=as.factor(cylinders)
plot(cylinders,mpg,xlab="Cylinders",ylab="Mpg",col="red")
```
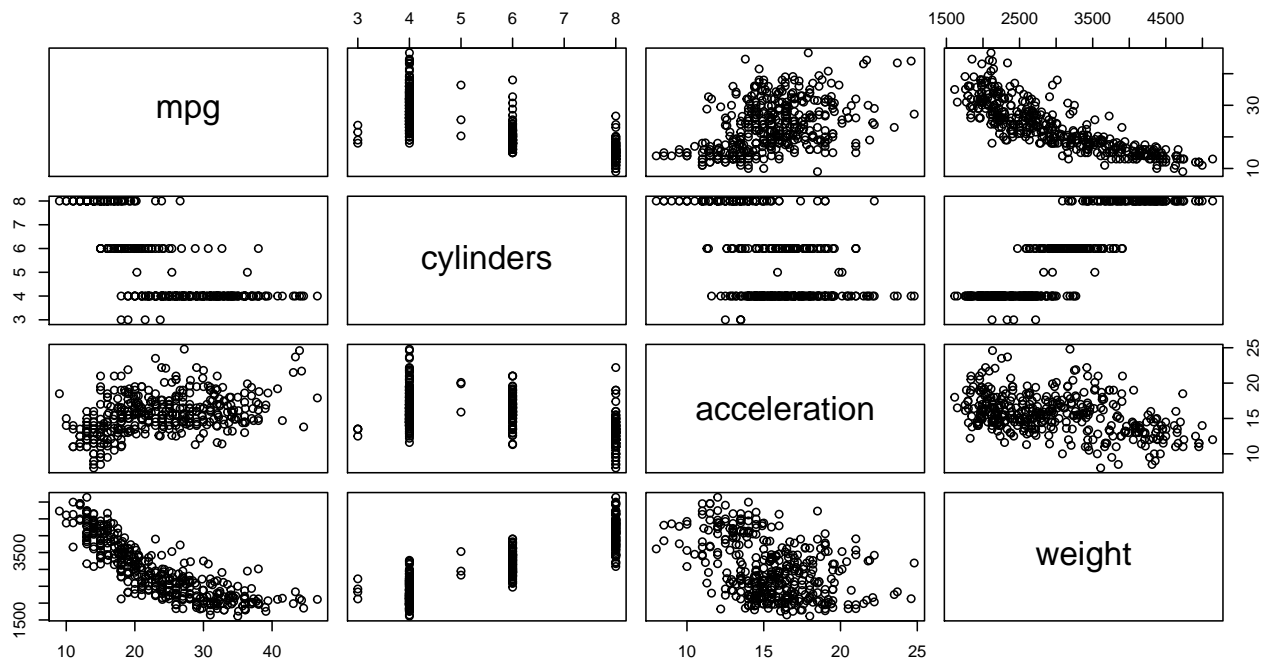
```
pdf(file="./mpg.pdf") # Save as PDF
plot(cylinders,mpg,xlab="Cylinders",ylab="Mpg",col="red")
dev.off()
```

```
## pdf
##   2
```

```
pairs(Auto,col="brown")
```



```
pairs(mpg~cylinders+acceleration+weight,Auto)
```

```
#q() # Quit R
```