Assignment 1_Mayank_Jaggi

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Question 1

1.1

```
x=rnorm(25)                                  #generating random numbers with std normal distribution
print(x)                                     #vector with 25 elements
```

```
##  [1]  0.57398279  1.27565427 -0.52737733  1.30561857  0.15069002
##  [6]  0.20115552  0.07782492 -0.12862648 -0.52875153  0.70535904
## [11] -0.05888155  0.34047775  0.56976437  0.14071890  1.18139137
## [16] -0.53013647 -2.36733423  0.84897167  2.45160413 -0.90619698
## [21]  1.12614695 -1.23980076  1.42251307 -0.19581888  0.58852059
```

1.2

1.2.1

Reshaping the vector into matrix

```
y1=matrix(x,nrow = 5,ncol = 5,byrow = TRUE)    #matrix by row
print(y1)
```

```
##              [,1]        [,2]       [,3]       [,4]       [,5]
## [1,]  0.57398279  1.27565427 -0.5273773  1.3056186  0.1506900
## [2,]  0.20115552  0.07782492 -0.1286265 -0.5287515  0.7053590
## [3,] -0.05888155  0.34047775  0.5697644  0.1407189  1.1813914
## [4,] -0.53013647 -2.36733423  0.8489717  2.4516041 -0.9061970
## [5,]  1.12614695 -1.23980076  1.4225131 -0.1958189  0.5885206
```

1.2.2

```
y2=matrix(x,nrow = 5,ncol = 5)                 #matrix by column
print(y2)
```

```
##              [,1]        [,2]        [,3]       [,4]       [,5]
## [1,]  0.5739828  0.20115552 -0.05888155 -0.5301365  1.1261470
## [2,]  1.2756543  0.07782492  0.34047775 -2.3673342 -1.2398008
## [3,] -0.5273773 -0.12862648  0.56976437  0.8489717  1.4225131
## [4,]  1.3056186 -0.52875153  0.14071890  2.4516041 -0.1958189
## [5,]  0.1506900  0.70535904  1.18139137 -0.9061970  0.5885206
```

1.3

```
x2=rnorm(100)                                        #generating random numbers
hist(x2,xlab ="Random Numbers",ylab ="Frequency", main ="Histogram for Random Numbers
      generated from Std Normal Distribution")
```

Histogram for Random Numbers generated from Std Normal Distribution
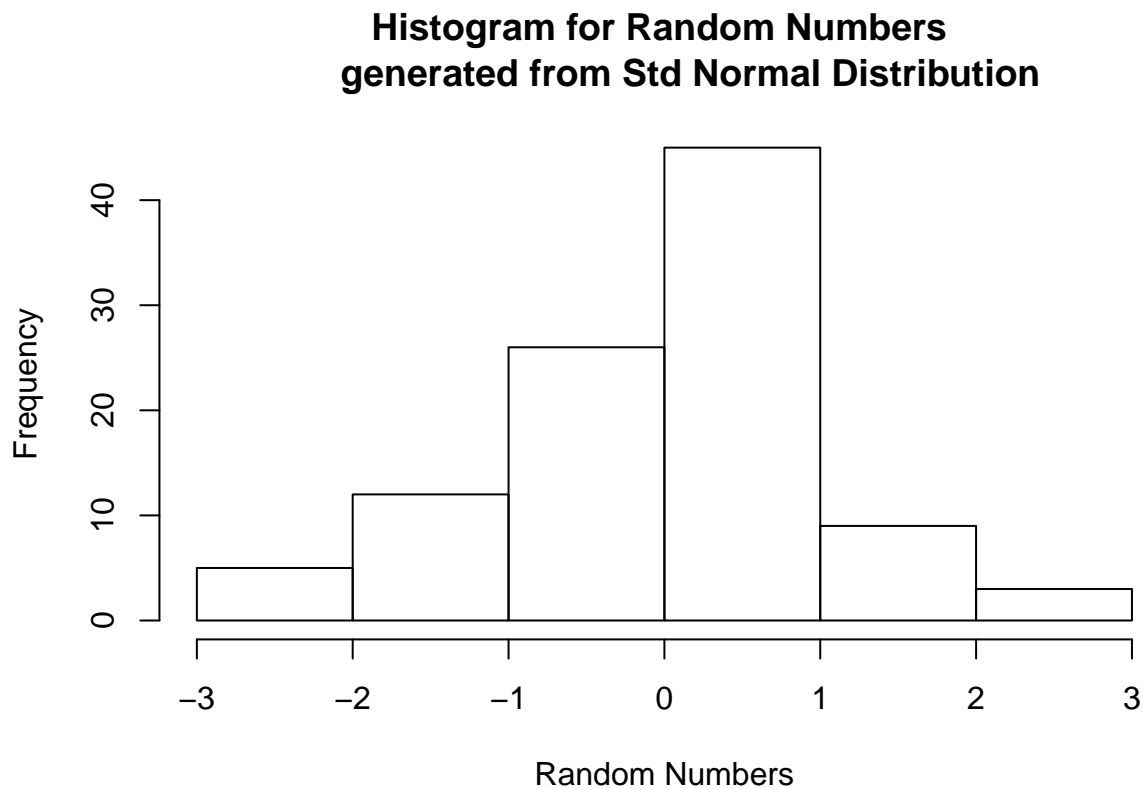
Question 2

```
library(ISLR)
fix(Auto)
names(Auto)                                          #display different atrributes in Auto dataset
```

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

Question 3

```
attach(Auto)                                         #attach concerned data frame
pairs(~ mpg + displacement + horsepower + weight + acceleration) #plotting pair of variables
```
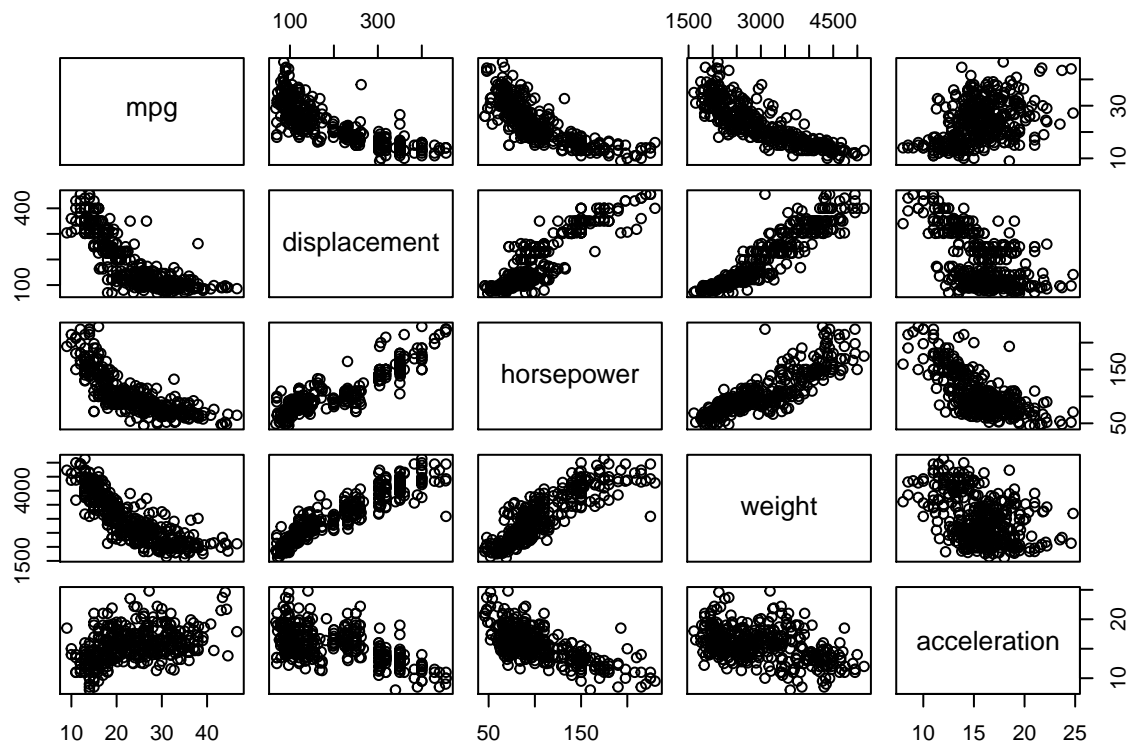
Relation between variables:

1.mpg and displacement have a nonlinear negative correlation

2.mpg and horespower have a nonlinear negative correlation

3.mpg and weight have a linear positive correlation

4.mpg and acceleration have a no correlation

5.displacement and horsepower have a nonlinear positive correlation

6.displacement and weight have a linear positive correlation

7.displacement and accleration have a nolinear negative correlation

8.hoespower and weight have a linear positive correlation

9.horsepower and accleration have a nonlinear negative correlation

10.weight and acceleration have no correlation

Question 4

```r
plot(horsepower,mpg,main="Relation between mpg and horsepower")
abline(lm(mpg~horsepower),col="red")                #plot linear relation
```

Relation between mpg and horsepower
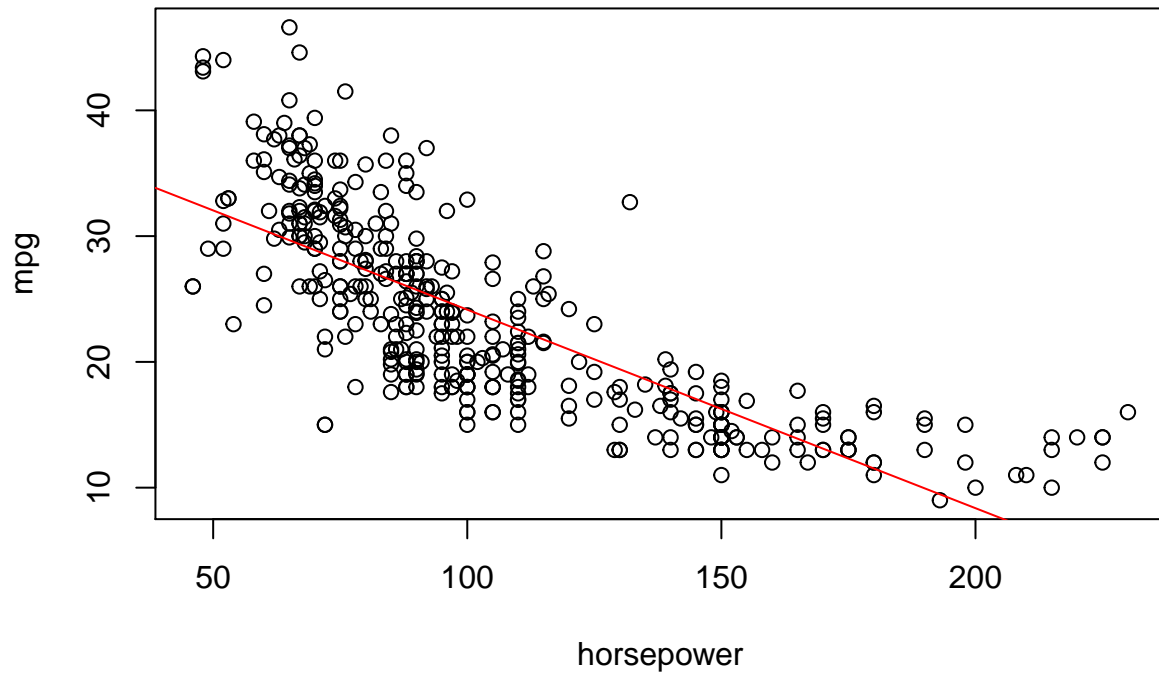

```
# Question 5
library(lattice)                                    #using new package for a non linear model
xyplot(mpg~horsepower, type=c("smooth","p"),col.line="red", main="mpg vs horsepower")
```

mpg vs horsepower