

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] -0.6657578  0.7140872 -0.9789825  1.7858442 -0.9364864  1.0098515
## [7]  1.0833691  0.5140443 -1.0144362 -0.1557213 -1.5912311 -0.2918741
## [13]  1.5318438  1.0739362  0.4634867  0.3065718  0.8294984  1.5854654
## [19] -0.9137642  0.7390879  2.7108033  0.9854277  0.2501486  1.2468965
## [25]  0.5365554
```

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,] -0.6657578  0.7140872 -0.9789825  1.7858442 -0.9364864
## [2,]  1.0098515  1.0833691  0.5140443 -1.0144362 -0.1557213
## [3,] -1.5912311 -0.2918741  1.5318438  1.0739362  0.4634867
## [4,]  0.3065718  0.8294984  1.5854654 -0.9137642  0.7390879
## [5,]  2.7108033  0.9854277  0.2501486  1.2468965  0.5365554
```

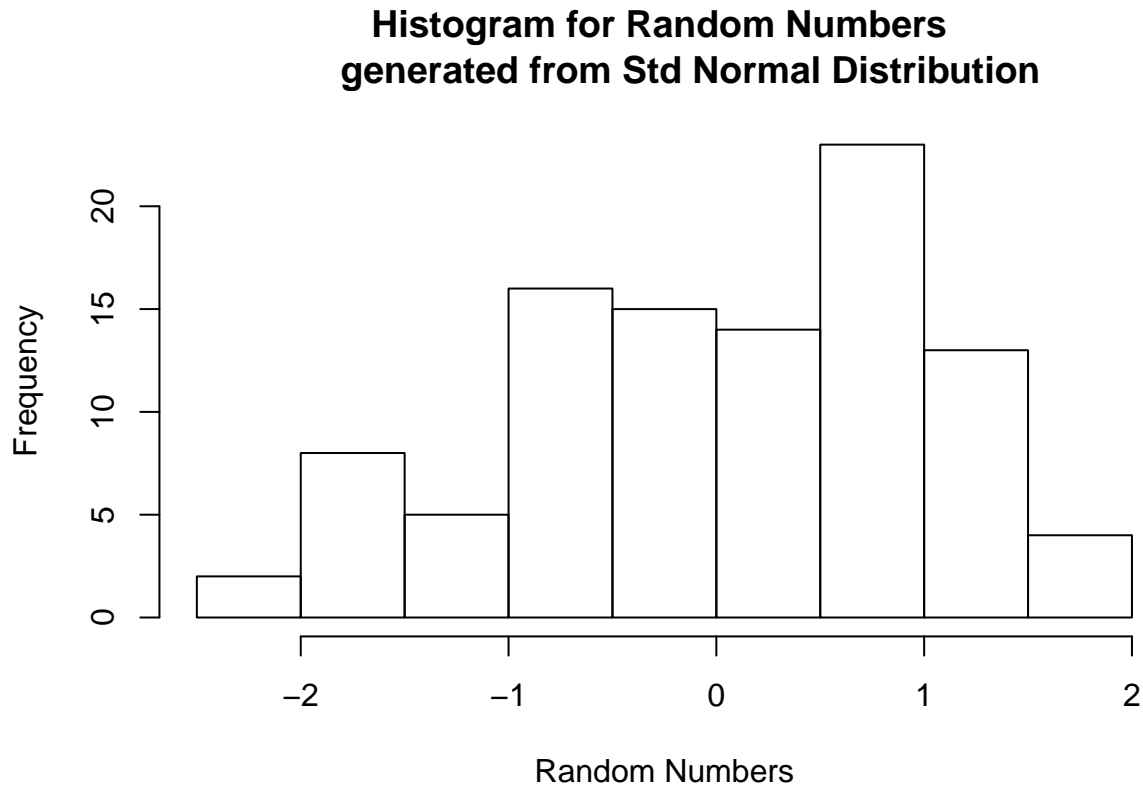
1.2.2

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

##           [,1]      [,2]      [,3]      [,4]      [,5]
## [1,] -0.6657578  1.0098515 -1.5912311  0.3065718  2.7108033
## [2,]  0.7140872  1.0833691 -0.2918741  0.8294984  0.9854277
## [3,] -0.9789825  0.5140443  1.5318438  1.5854654  0.2501486
## [4,]  1.7858442 -1.0144362  1.0739362 -0.9137642  1.2468965
## [5,] -0.9364864 -0.1557213  0.4634867  0.7390879  0.5365554
```

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")
```



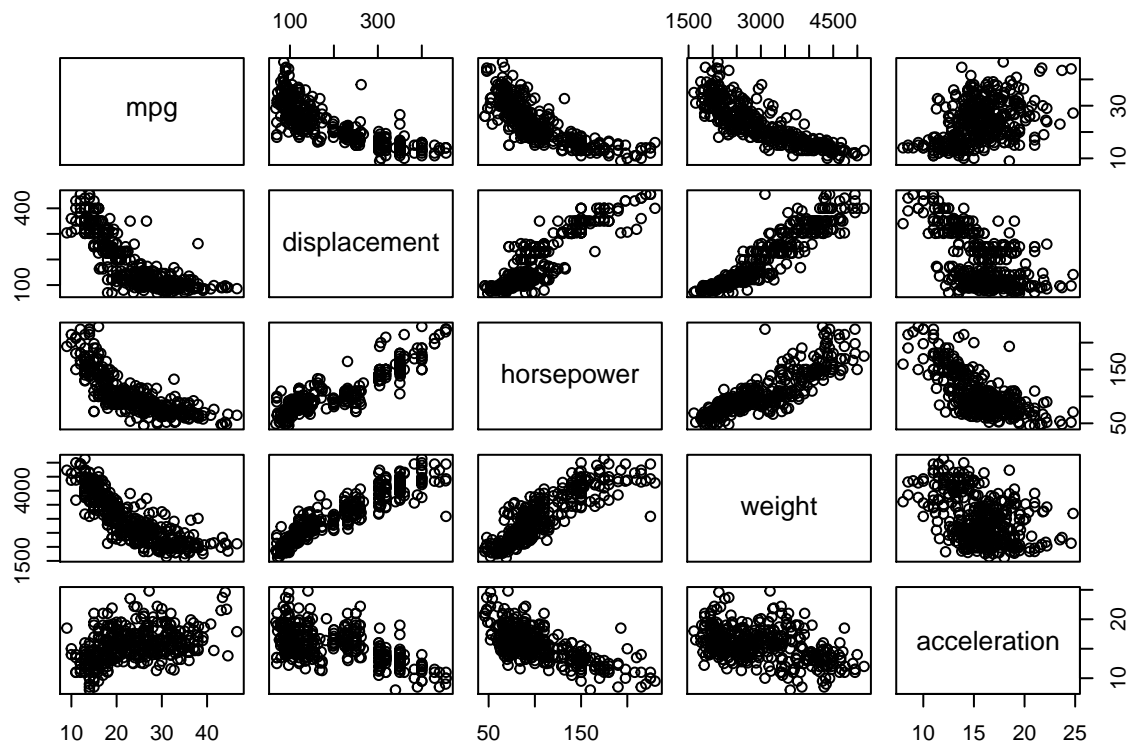
Question 2

```
library(ISLR)
fix(Auto)
names(Auto) #display different attributes 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
```



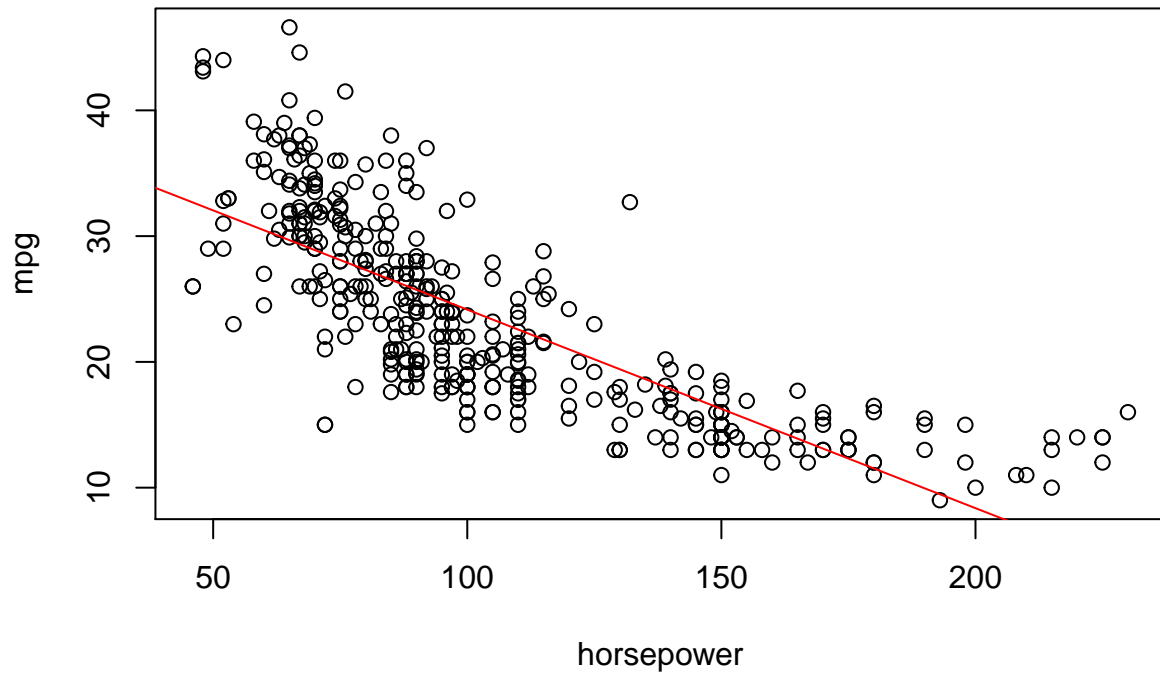
Relation between variables:

- 1.mpg and displacement have a nonlinear negative correlation
- 2.mpg and horsepower 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 acceleration have a nonlinear negative correlation
- 8.horsepower and weight have a linear positive correlation
- 9.horsepower and acceleration have a nonlinear negative correlation
- 10.weight and acceleration have no correlation

Question 4

```
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