

Assignment-1

#1.

Here we have used read.csv command to get the information from the file.

```
> al<-read.csv("G:/Fall Semester 2017/ISL/Auto-rev.csv",header=TRUE)
> head(al)
  mpg cylinders displacement horsepower weight acceleration year origin
1  18         8         307         130   3504          12.0    70      1
2  15         8         350         165   3693          11.5    70      1
3  18         8         318         150   3436          11.0    70      1
4  16         8         304         150   3433          12.0    70      1
5  17         8         302         140   3449          10.5    70      1
6  15         8         429         198   4341          10.0    70      1
  name
1 chevrolet chevelle malibu
2   buick skylark 320
3   plymouth satellite
4     amc rebel sst
5     ford torino
6     ford galaxie 500
```

```
> al.mod1=lm(mpg~horsepower,data=al)
> summary(al.mod1)

Call:
lm(formula = mpg ~ horsepower, data = al)

Residuals:
    Min       1Q   Median       3Q      Max
-13.5710  -3.2592  -0.3435   2.7630  16.9240

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept)  39.935861    0.717499   55.66  <2e-16 ***
horsepower   -0.157845    0.006446  -24.49  <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 4.906 on 390 degrees of freedom
Multiple R-squared:  0.6059,    Adjusted R-squared:  0.6049
F-statistic: 599.7 on 1 and 390 DF,  p-value: < 2.2e-16

> |
```

- a. 1. From summary we could interpret that p-value is $<2.2e^{-16}$ and so there is a good relationship between mpg and horsepower.

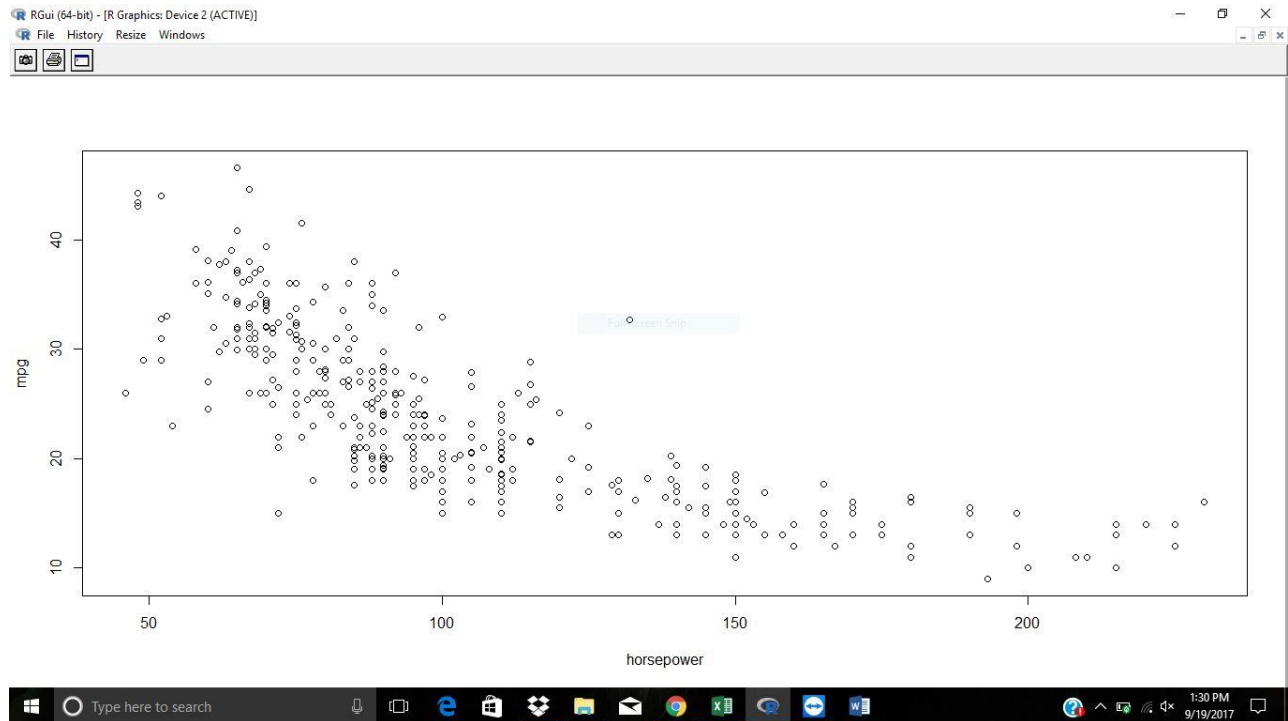
2. We could see that the response is strongly dependent on predictor as multiple R-squared value is 0.6059 (ie. 60.59% dependent).

3. The coefficient obtained is negative (-0.1578) which means that relationship between mpg and horsepower is negative.

4. Screenshot of predicted mpg associated with a horsepower of 98:

```
> predict(al.mod1, data.frame(horsepower=c(98)), interval="prediction")
      fit      lwr      upr
1 24.46708 14.8094 34.12476
> predict(al.mod1, data.frame(horsepower=c(98)), interval="confidence")
      fit      lwr      upr
1 24.46708 23.97308 24.96108
>
>
> plot(mpg~horsepower, data=al, xlab="horsepower", ylab="mpg")
> abline(al.mod1, col="red")
```

5. Plotting of the response:



`abline():`

