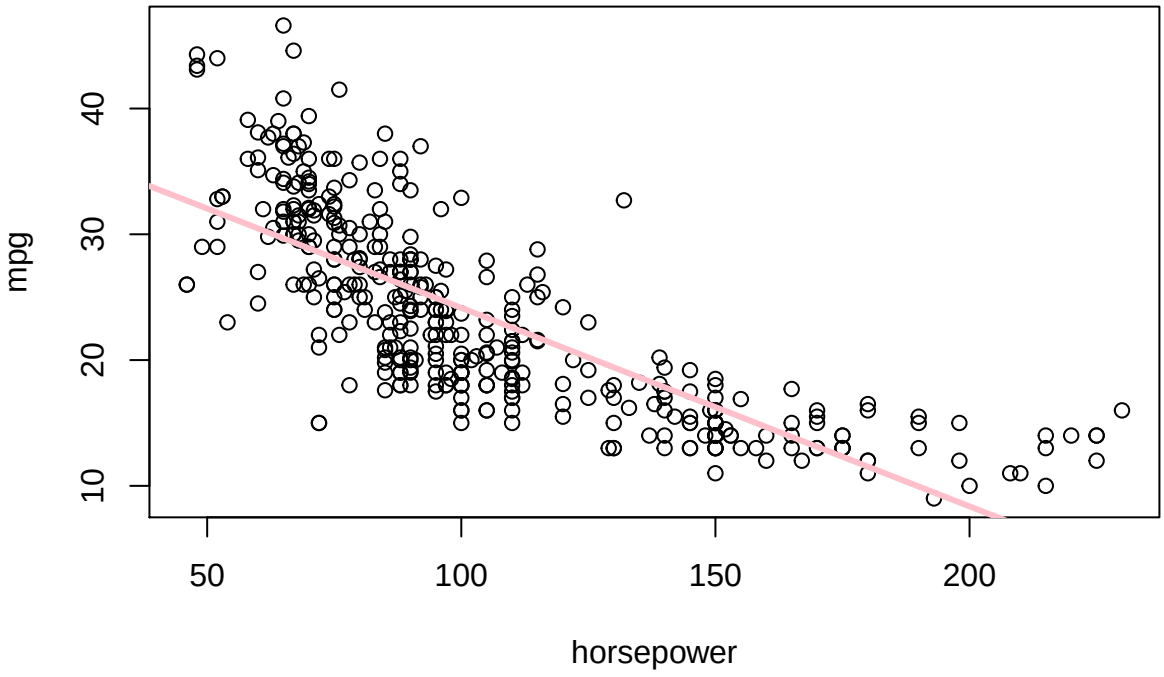
Linear Regression Practice

Hi

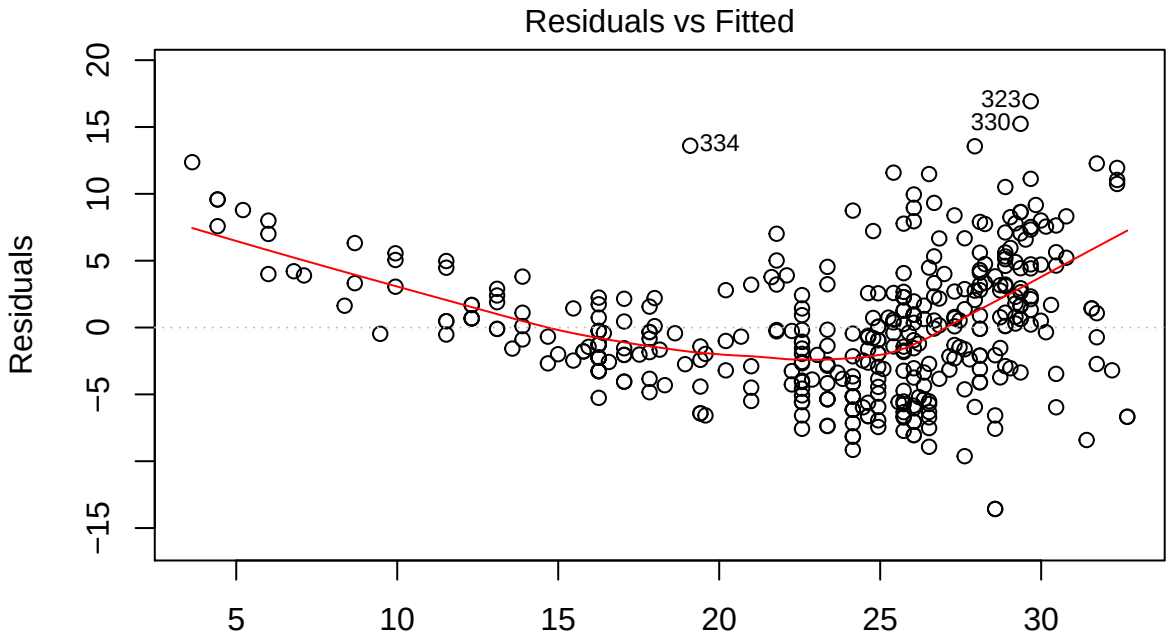
```
library(ISLR)
lm.fit = lm(mpg~horsepower,data= Auto) #lm(response~ predictor)
summary(lm.fit)
```

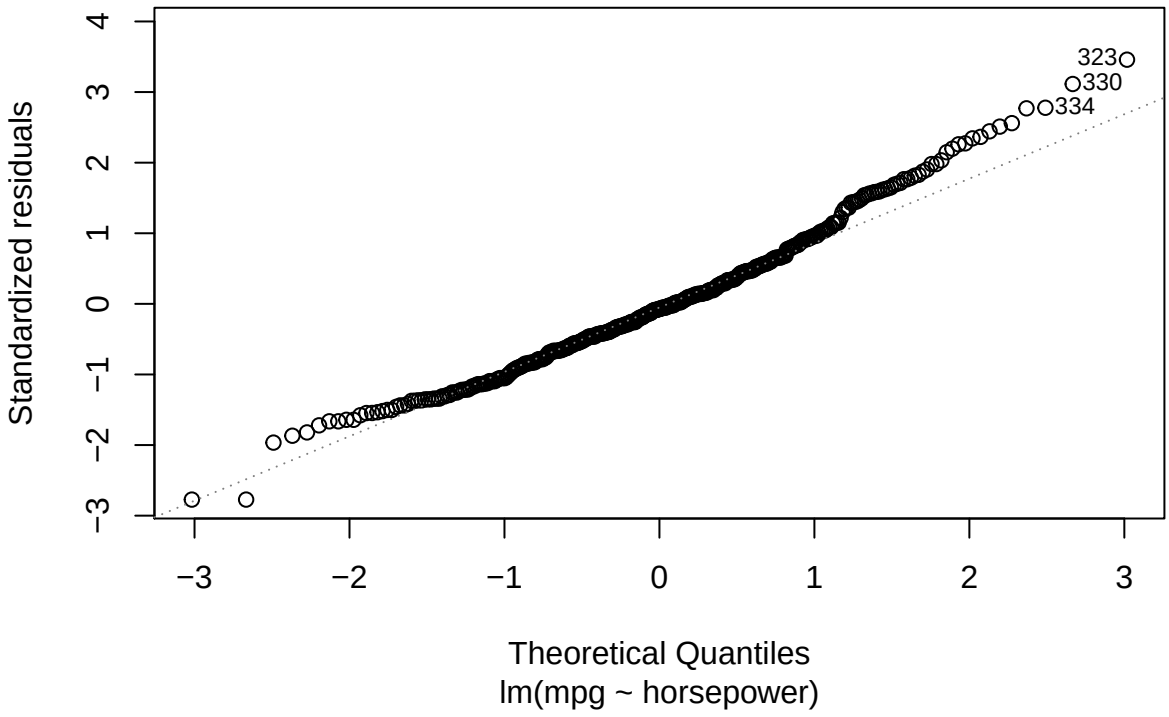
```
##
## Call:
## lm(formula = mpg ~ horsepower, data = Auto)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -13.5710  -3.2592  -0.3435   2.7630  16.9240
##
## Coefficients:
##              Estimate Std. Error t value Pr(>|t|)
## (Intercept) 39.935861   0.717499   55.66   <2e-16 ***
## 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
```

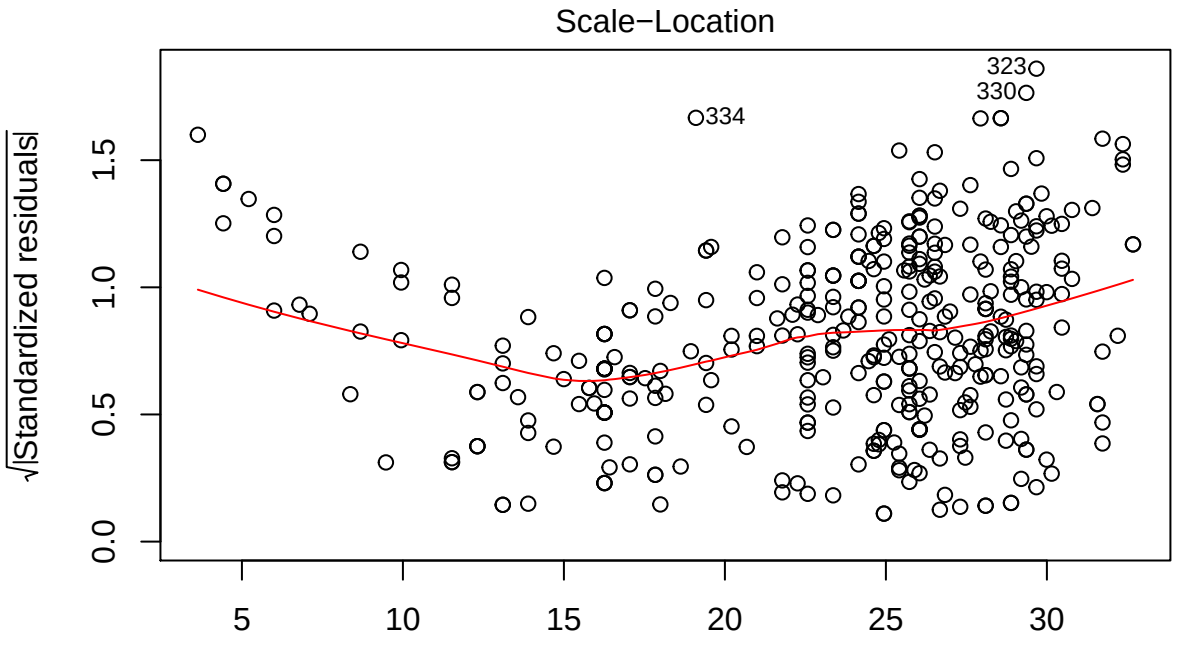
```
plot(Auto$horsepower, Auto$mpg, xlab = "horsepower", ylab= "mpg") #observations
abline(lm.fit,lwd = 3,col ="pink") #best fit line
```

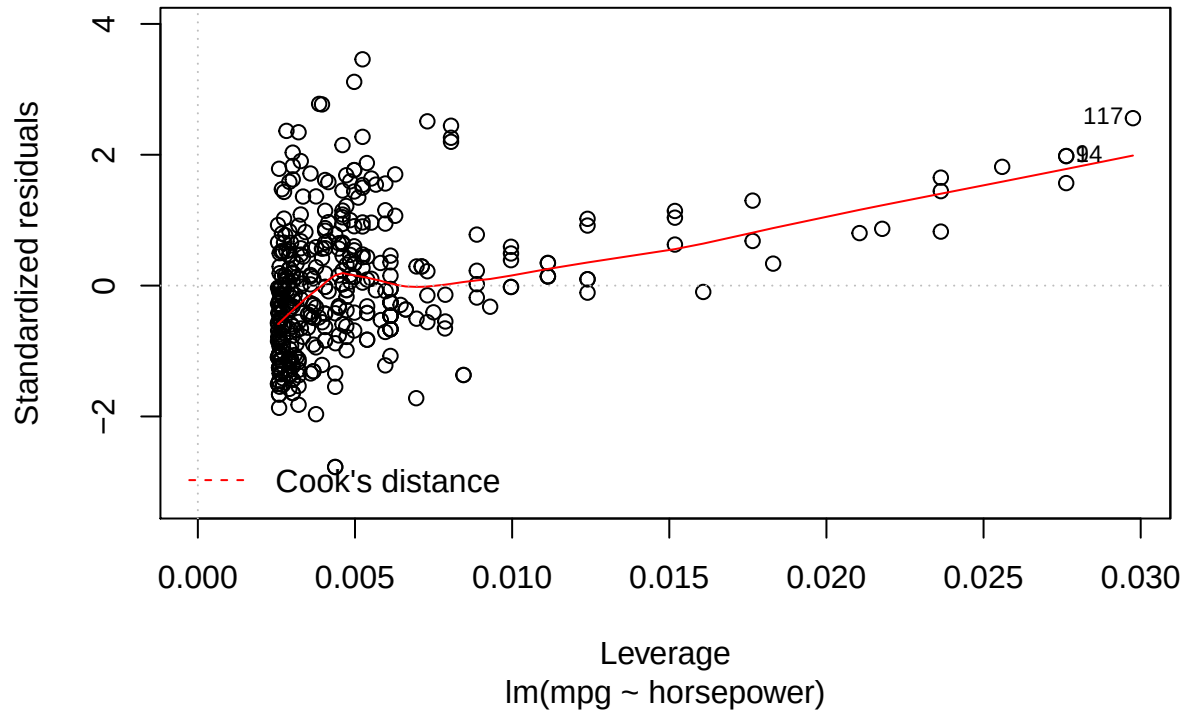



```
plot(lm.fit) #Helps you detect outliers, colinearity
```


Residuals vs Fitted
Residuals
Fitted values
lm(mpg ~ horsepower)
323
330
334


Normal Q−Q
Standardized residuals
Theoretical Quantiles
lm(mpg ~ horsepower)
323
330
334


Scale−Location
√|Standardized residuals|
0.0
0.5
1.0
1.5
5
10
15
20
25
30
323
330
334
Fitted values
lm(mpg ~ horsepower)


Residuals vs Leverage
Standardized residuals
−2
0
2
4
0.000
0.005
0.010
0.015
0.020
0.025
0.030
117
94
Cook's distance
Leverage
lm(mpg ~ horsepower)