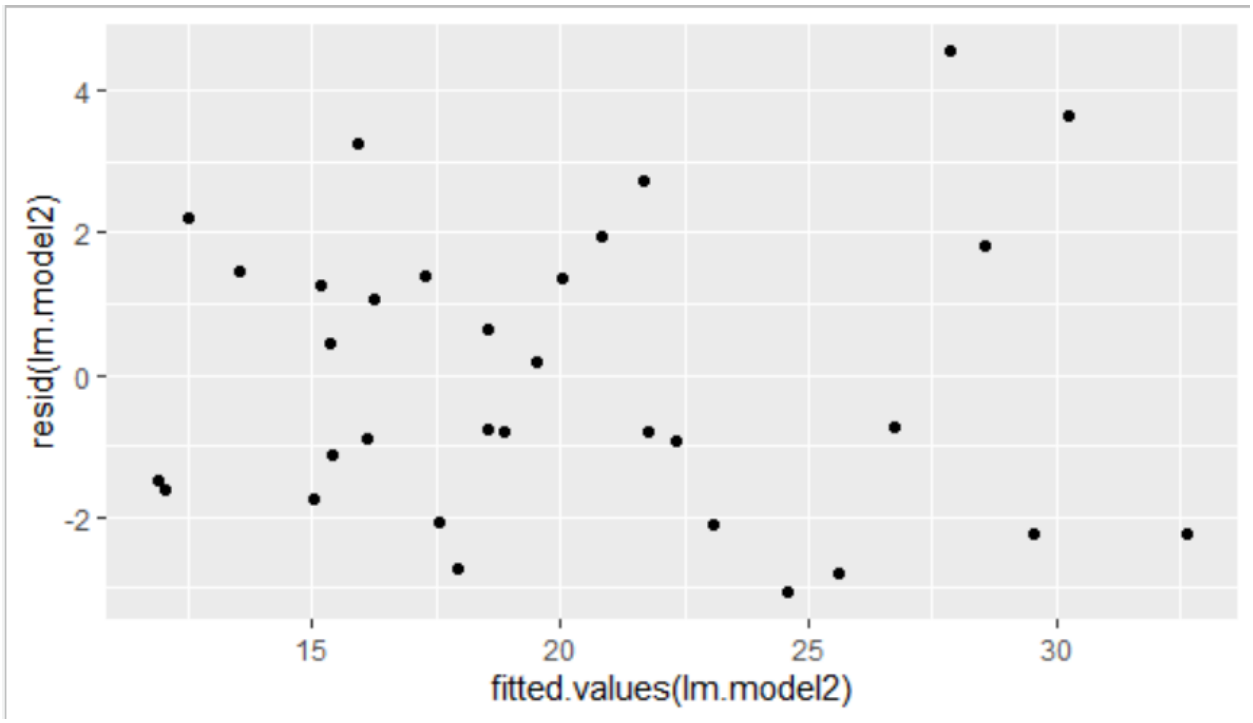
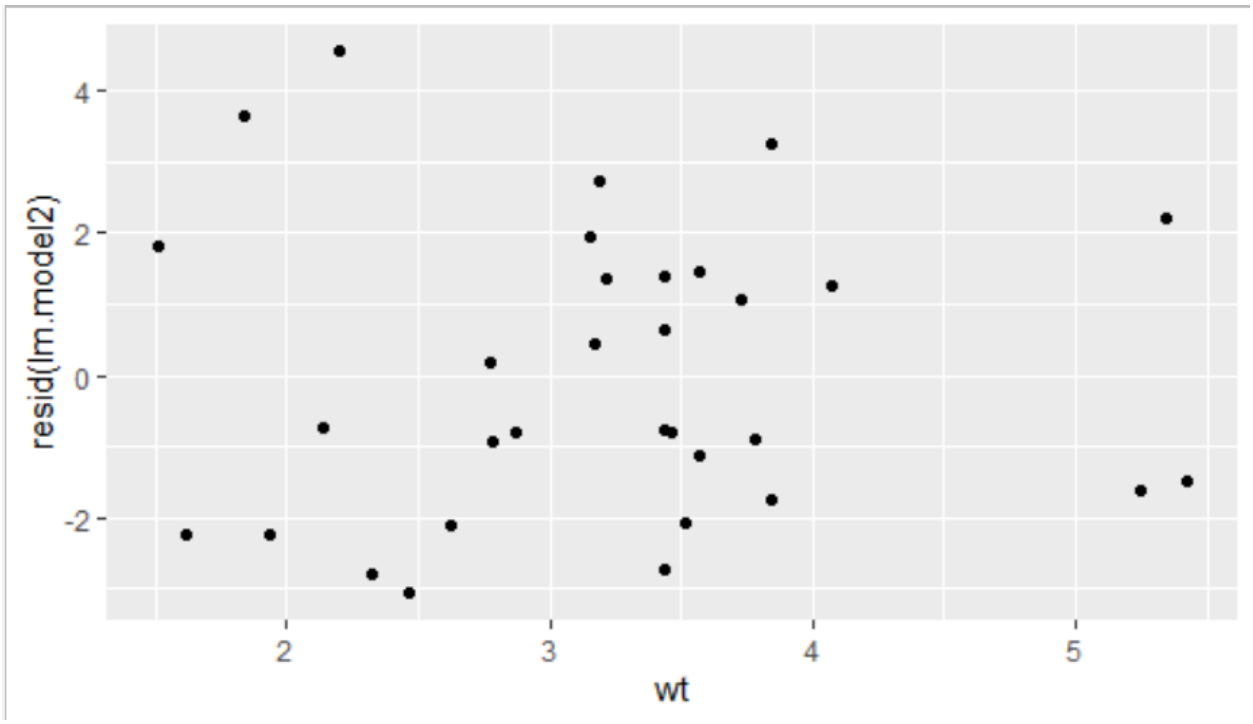
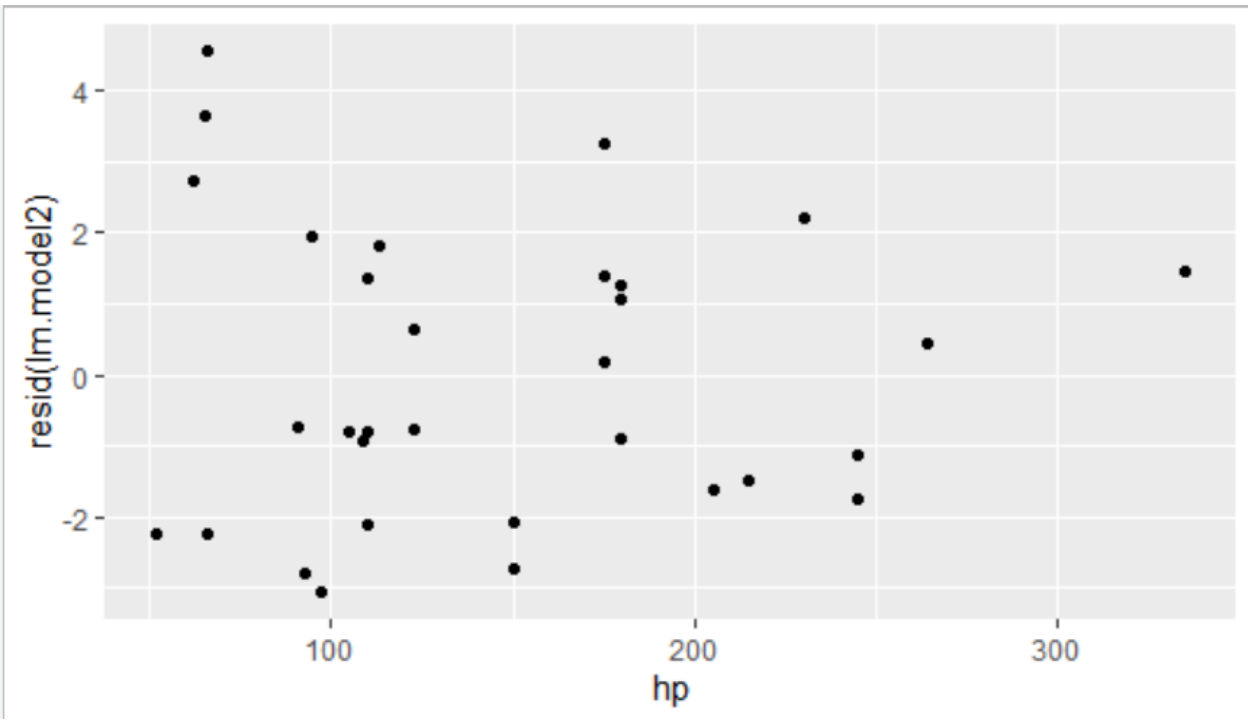
Virtual Lab – Diagnostics2

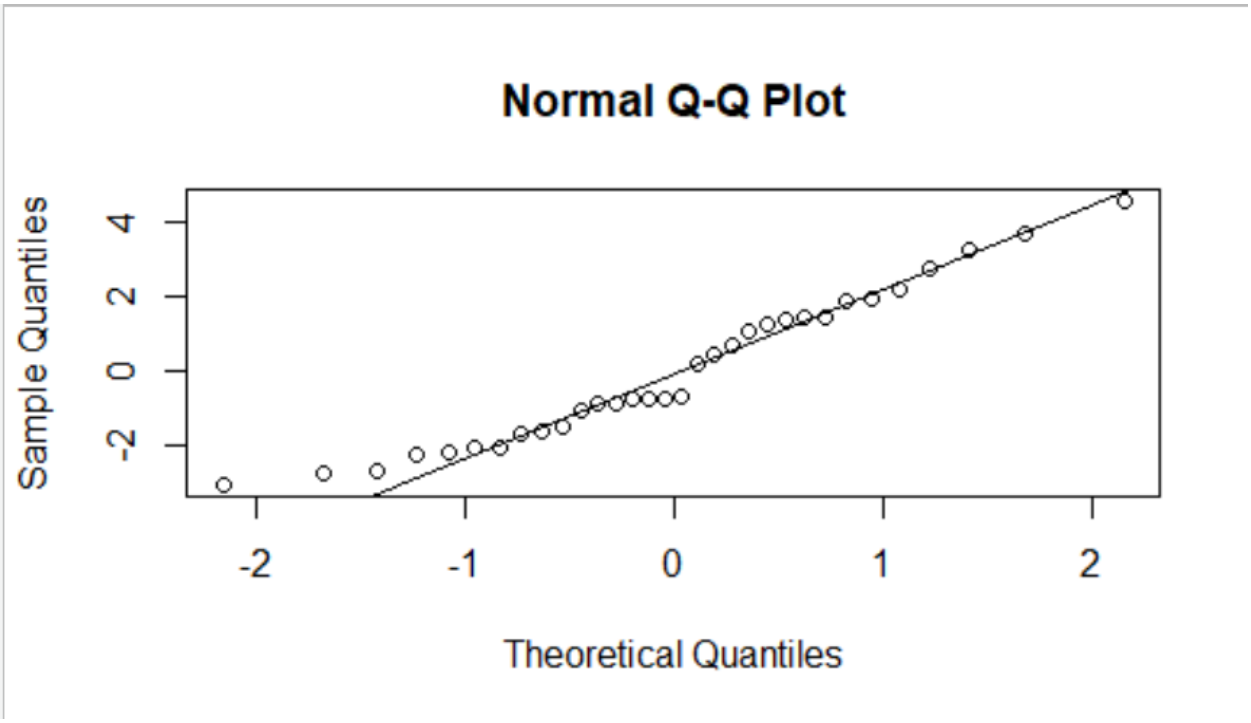
We will continue with the use of the mtcars data set in R (in the car package). For this lab, find the best model (be sure to explore diagnostics, multicollinearity and influential points).

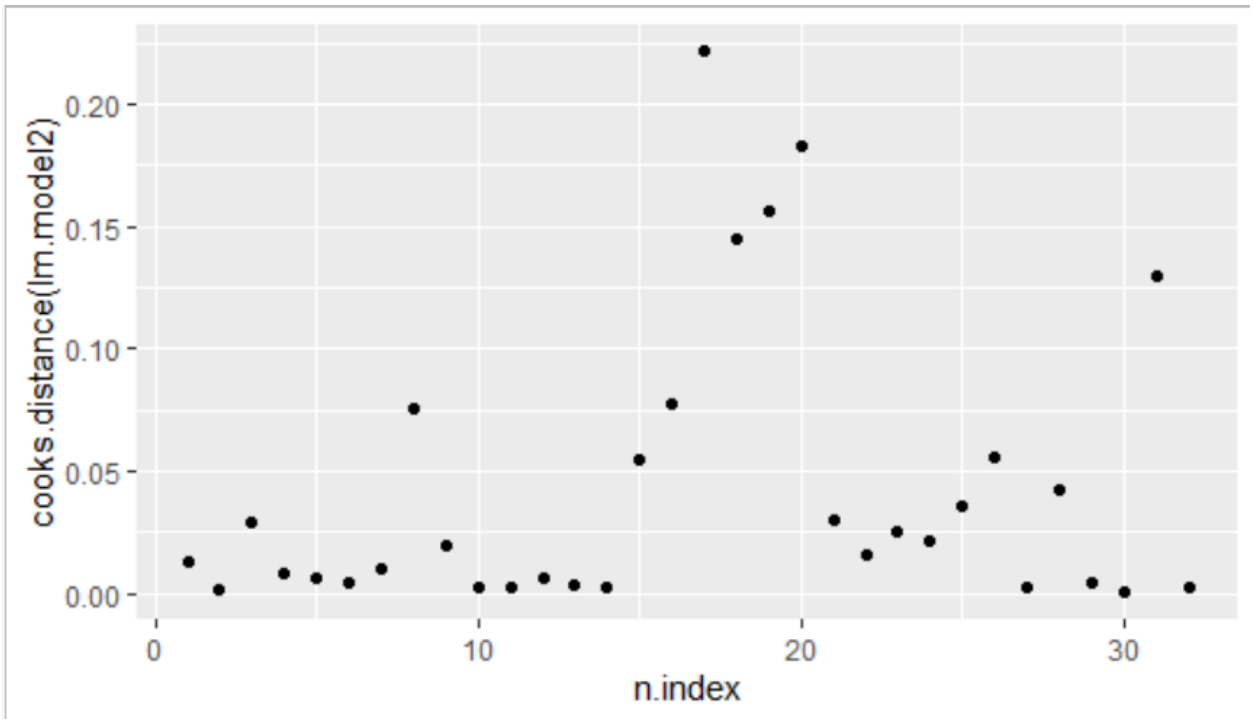
```
mpg ~ wt + hp + wt:hp

Coefficients:

            Estimate Std. Error t value Pr(>|t|)

(Intercept) 49.80842    3.60516  13.816 5.01e-14 ***

wt          -8.21662    1.26971  -6.471 5.20e-07 ***

hp          -0.12010    0.02470  -4.863 4.04e-05 ***

wt:hp        0.02785    0.00742   3.753 0.000811 ***

>
ggplot(lm.model2,aes(x=fitted.values(lm.model2),y=resid(lm.model2)))+g
eom_point()

> ggplot(lm.model2,aes(x=wt,y=resid(lm.model2)))+geom_point()

> ggplot(lm.model2,aes(x=hp,y=resid(lm.model2)))+geom_point()

> qqnorm(resid(lm.model2))

> qqline(resid(lm.model2))

> n.index=seq(1,nrow(mtcars))

>
ggplot(lm.model2,aes(x=n.index,y=cooks.distance(lm.model2)))+geom_poin
t()

> ggplot(lm.model2,aes(x=n.index,y=hatvalues(lm.model2)))+geom_point()

> ggplot(lm.model2,aes(x=n.index,y=dffits(lm.model2)))+geom_point()

> ggplot(lm.model2,aes(x=n.index,y=rstudent(lm.model2)))+geom_point()


p=4

n=32
```


resid(lm.model2)
4
2
0
-2
15
20
25
30
fitted.values(lm.model2)

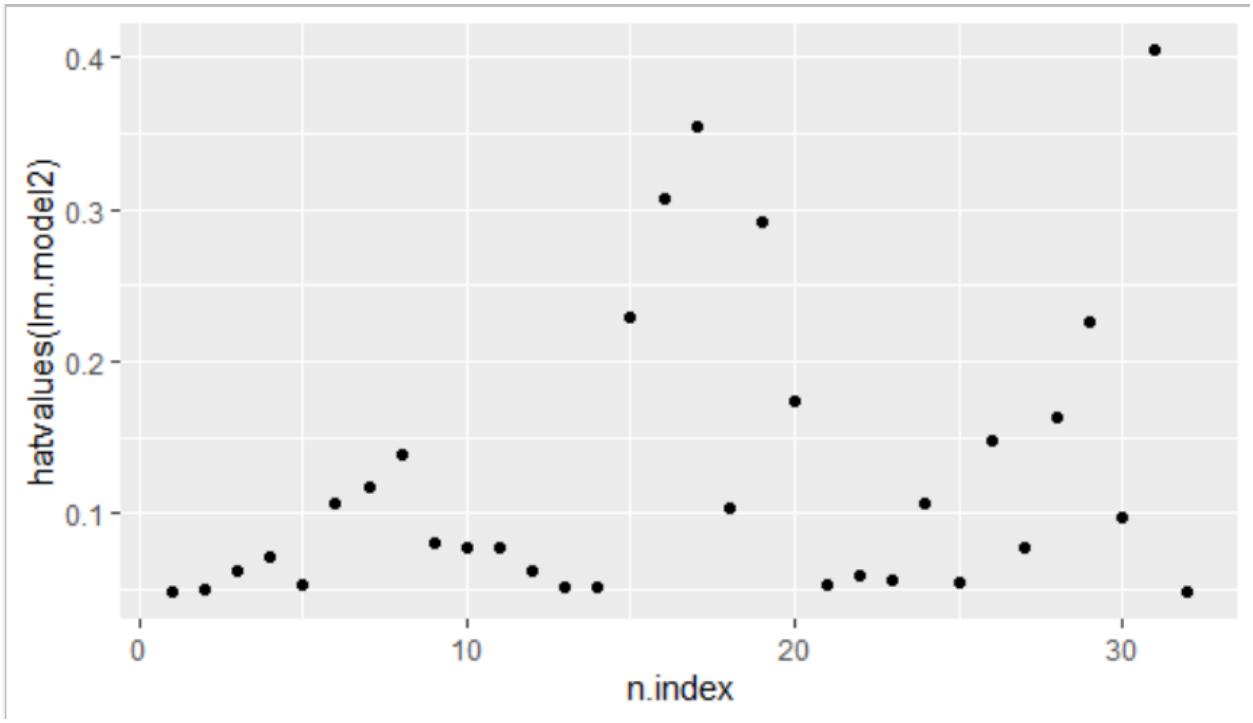

resid(lm.model2)
4
2
0
-2
2
3
4
5
wt


resid(lm.model2)
4
2
0
-2
100
200
300
hp

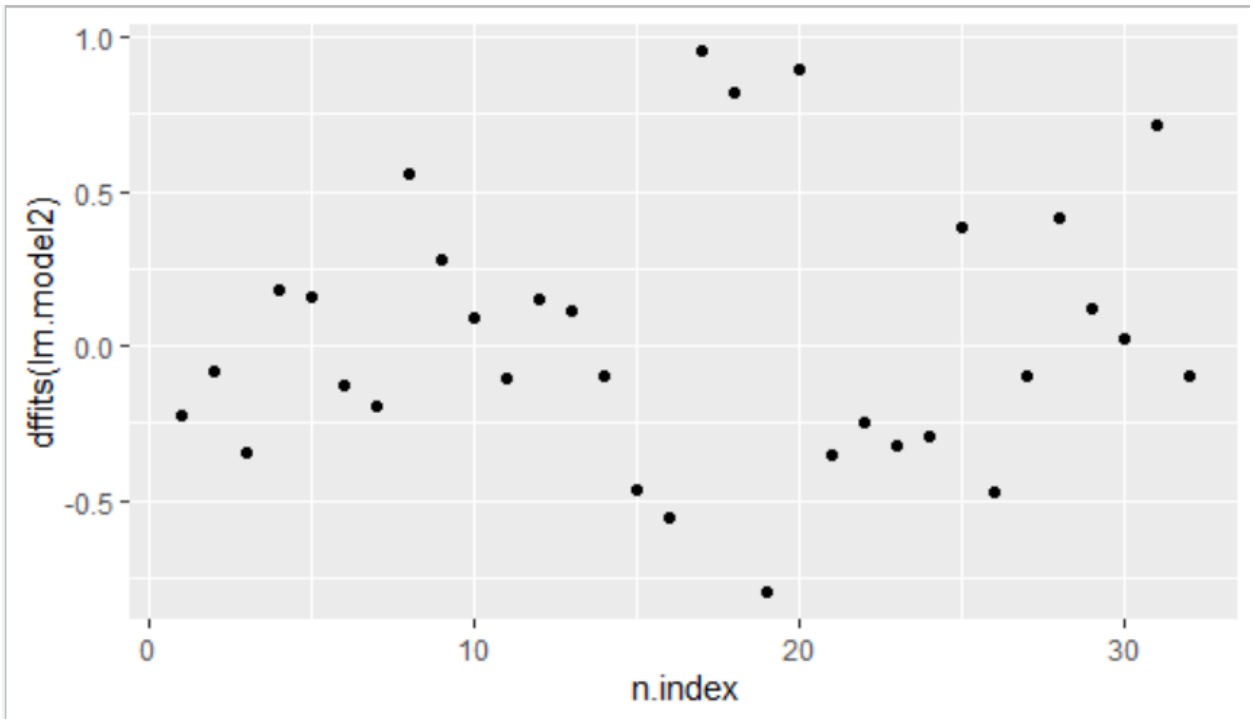

Normal Q-Q Plot
Sample Quantiles
-2
0
2
4
-2
-1
0
1
2
Theoretical Quantiles



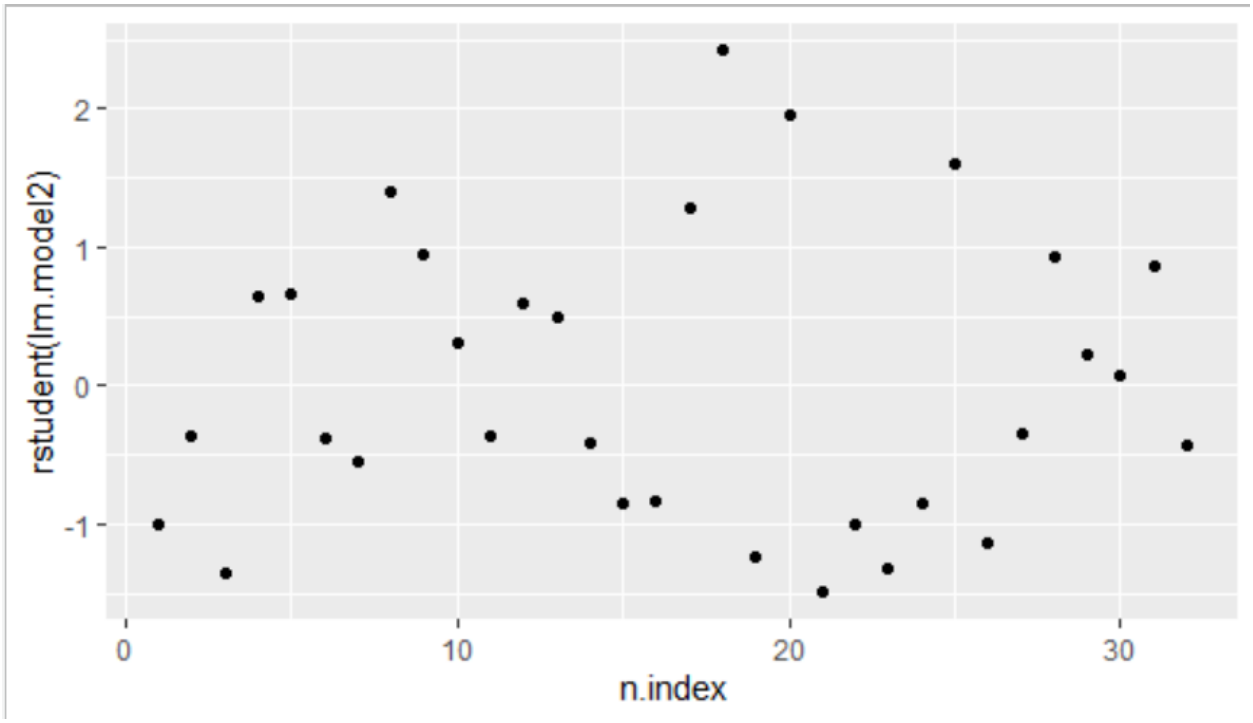
Cook's D: 0.148

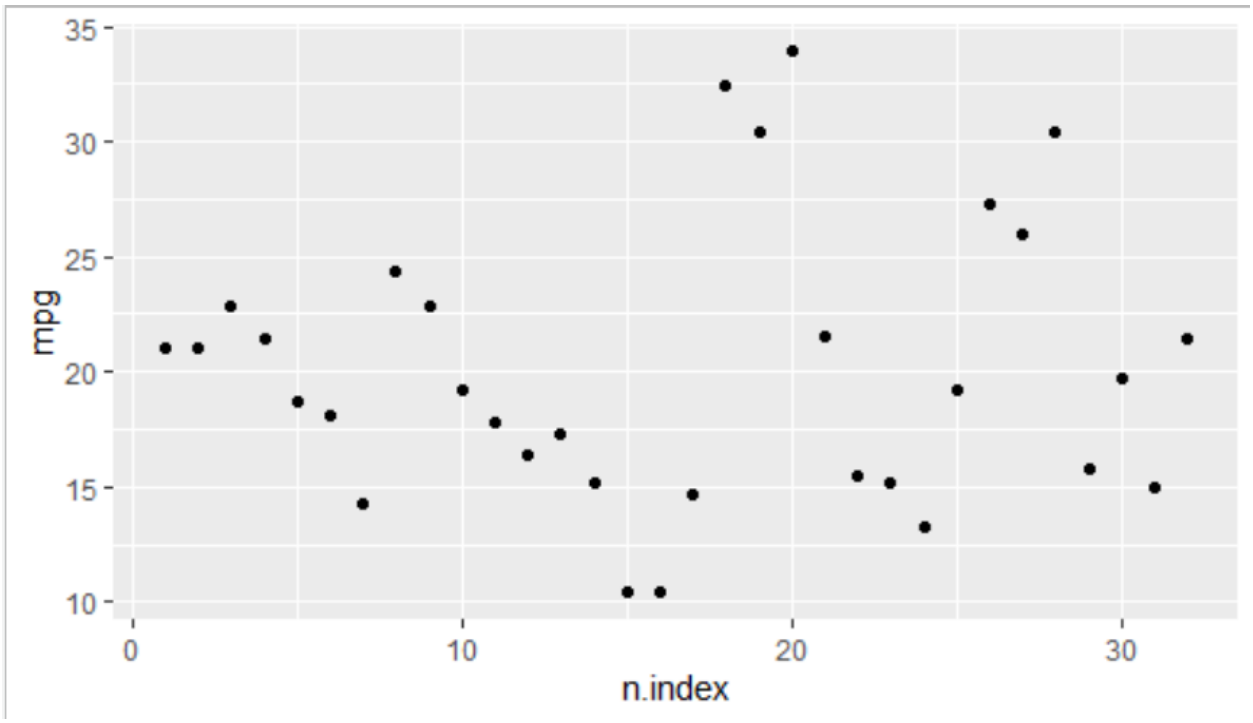


Hat: 0.25


1.0
0.5
0.0
-0.5
dffits(lm.model2)
0
10
20
30
n.index

Dffits: 0.71


2
1
0
-1
rstudent(lm.model2)
0
10
20
30
n.index




```
> mtcars[17:20,]
                  mpg cyl  disp  hp drat    wt  qsec vs am gear carb
Chrysler Imperial 14.7   8 440.0 230 3.23 5.345 17.42  0  0    3    4
Fiat 128          32.4   4  78.7  66 4.08 2.200 19.47  1  1    4    1
Honda Civic       30.4   4  75.7  52 4.93 1.615 18.52  1  1    4    2
Toyota Corolla    33.9   4  71.1  65 4.22 1.835 19.90  1  1    4    1
```