STAT202A

Assignment 6

BHARGAV PARSI

(804945591)

```
user  system elapsed
0.92    0.45    1.39
```

QR for n = 20 and p = 500 in RCPP

```
user  system elapsed
2.08    0.30    2.39
```

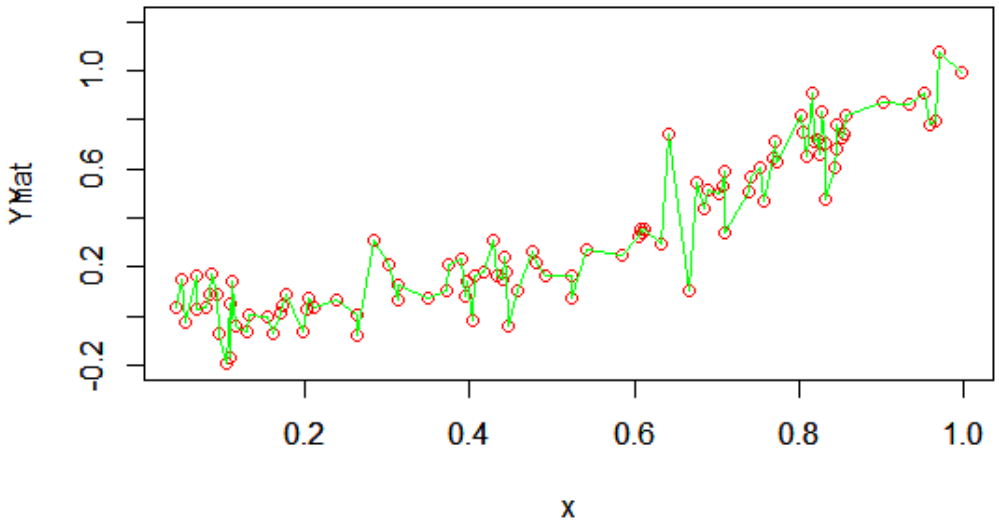
QR for n = 20 and p = 500 in R

```
user  system elapsed
0.44    0.00    0.44
```

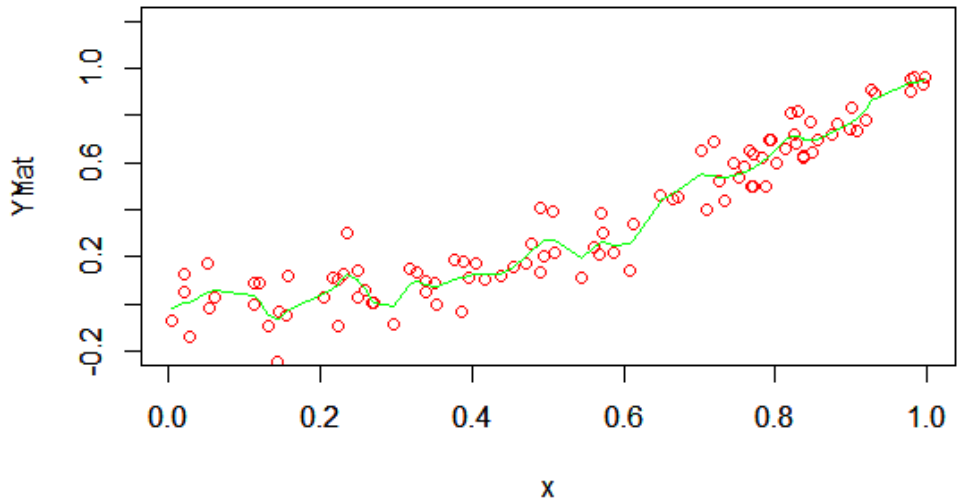
Sweep for n = 20 and p = 500 in Rcpp

```
  user  system elapsed
337.20    0.01  337.43
```

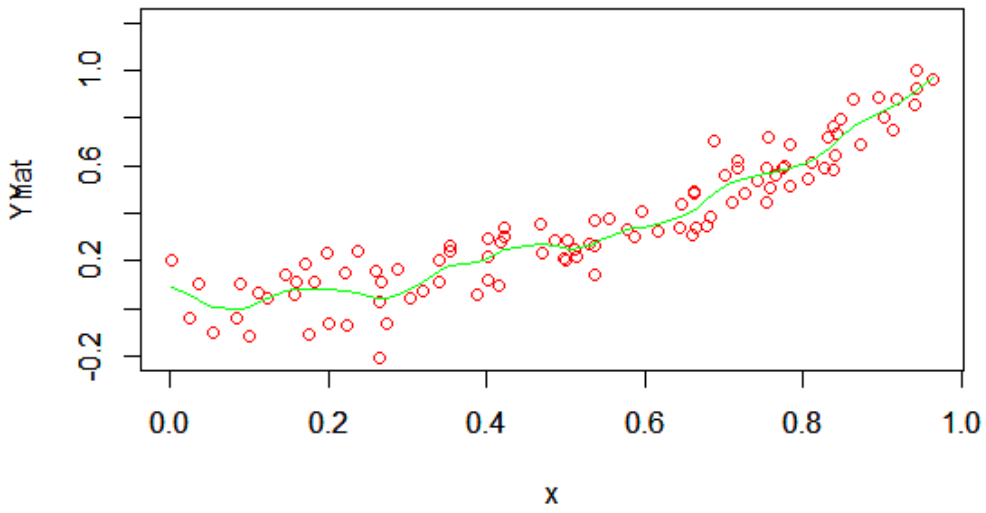
Sweep for n = 20 for p = 500 in R



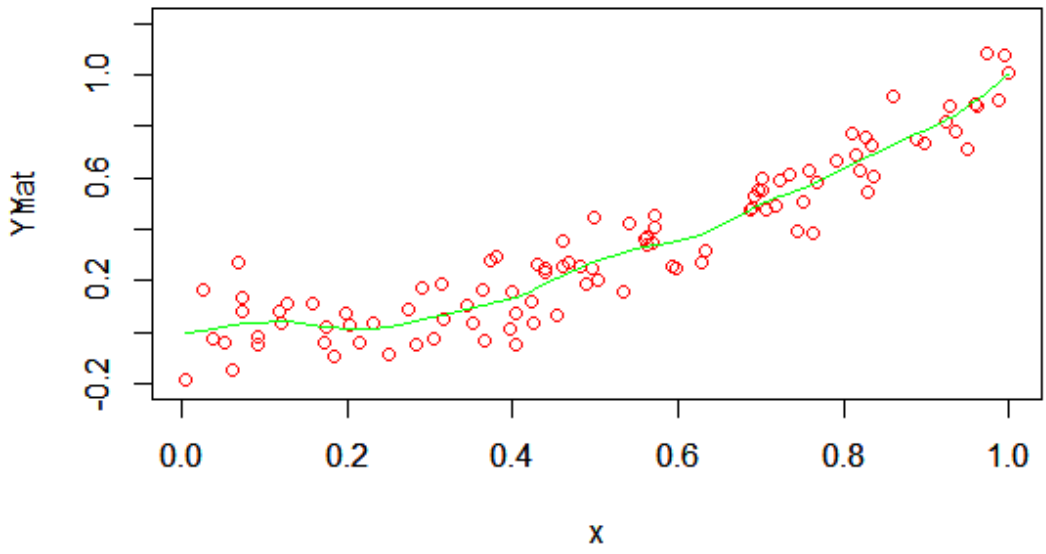
N = 100, P = 500, lambda = 0



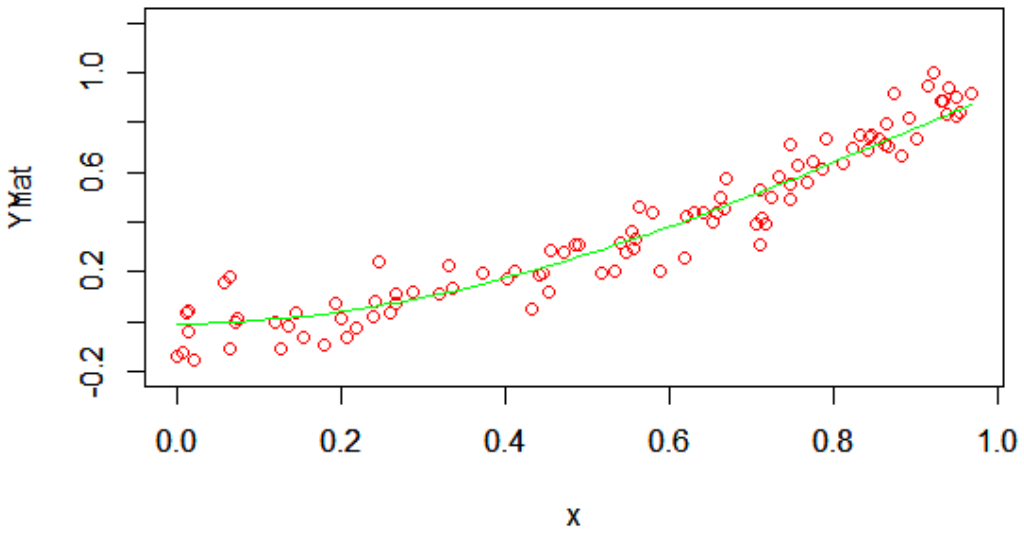
N = 100, P = 500, lambda = 0.001



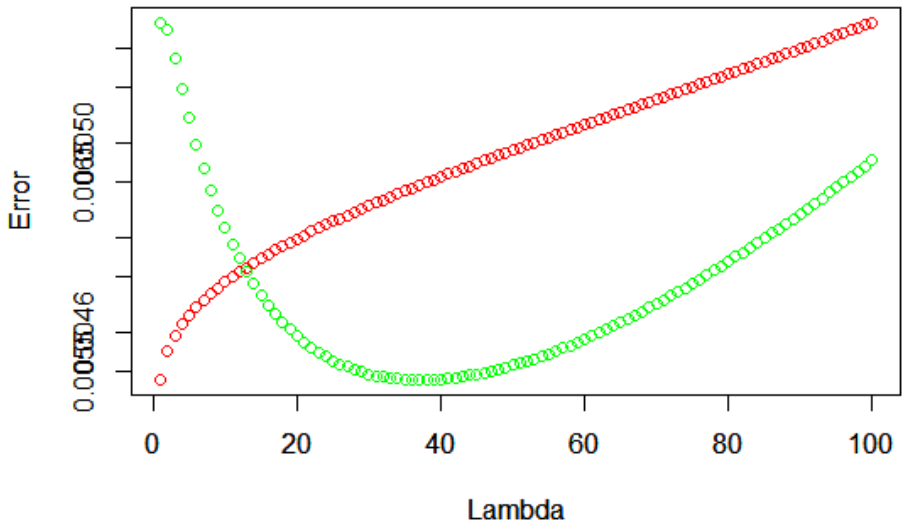
Lambda = 0.01



Lambda = 0.1



Lambda = 100



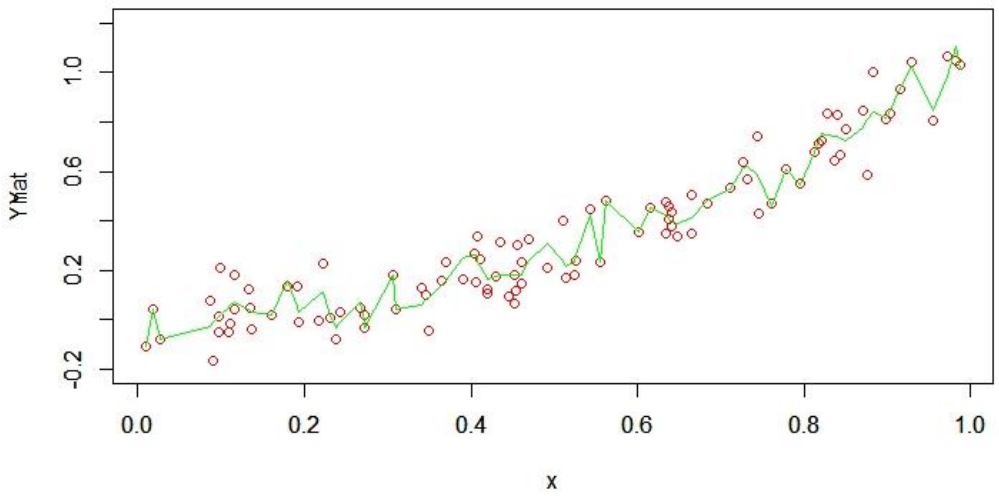
Green – Test Error, Red – Train Error

N = 50, P = 1000

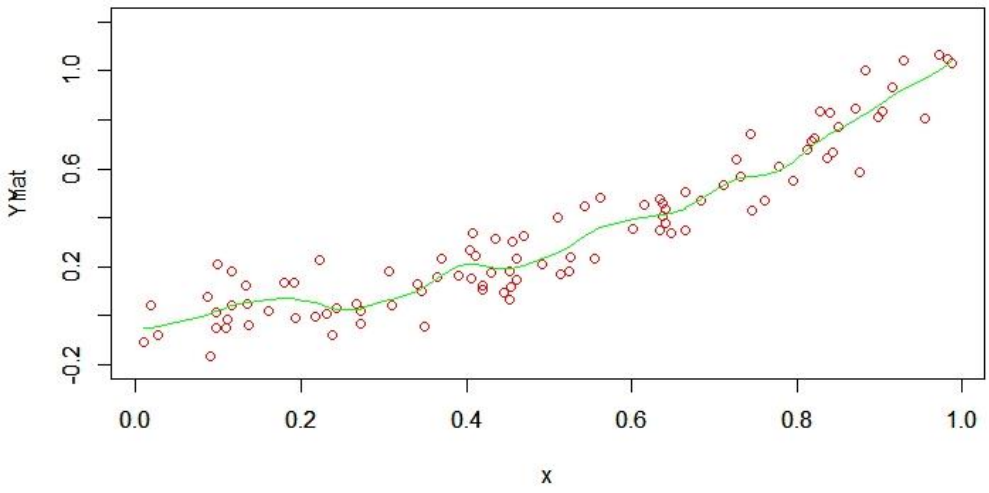
As lambda is low, training error is low and testing error is high, as the model is overfitting, as lambda increases, Training error and testing error increase due to under fitting.

Ridge Regression:

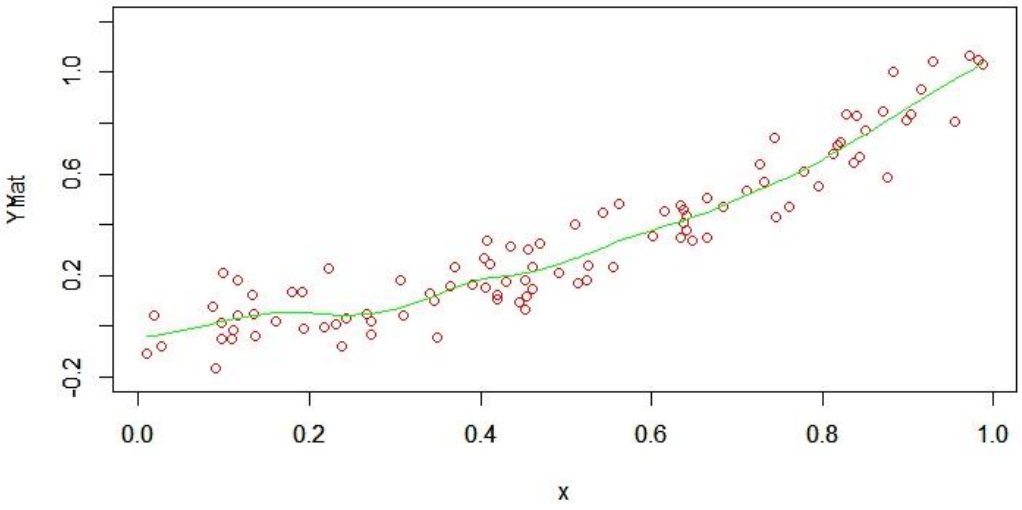
We can observe the similar results in ridge regression also. As lambda increases, the curve overfits when lambda is small and under fits when lambda is large.



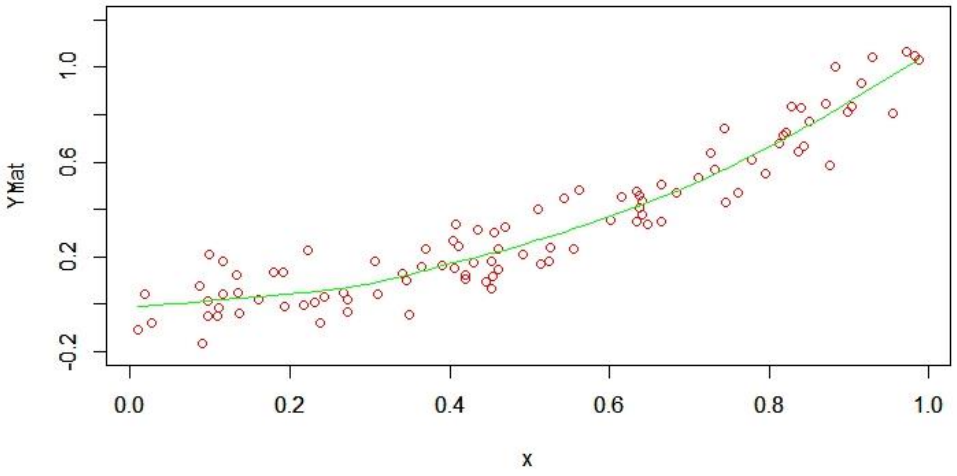
Lambda = 0



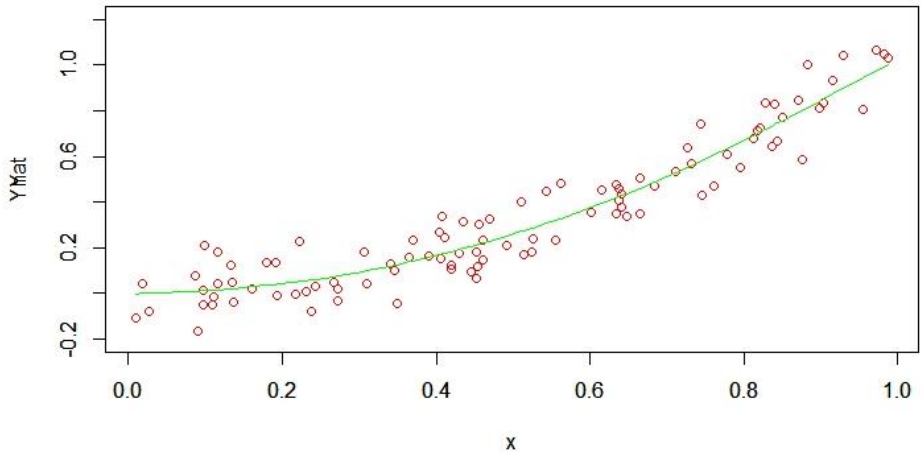
Lambda = 0.001



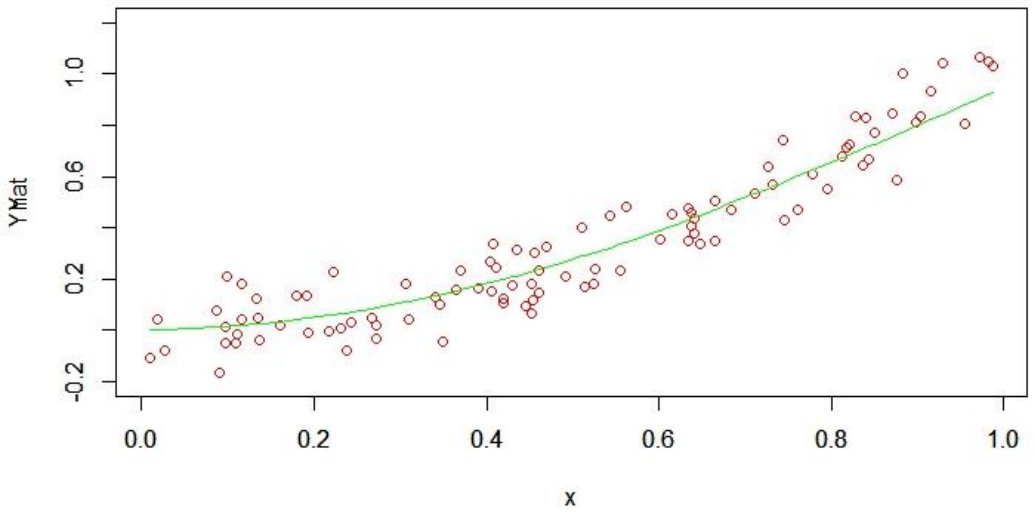
Lambda = 0.01



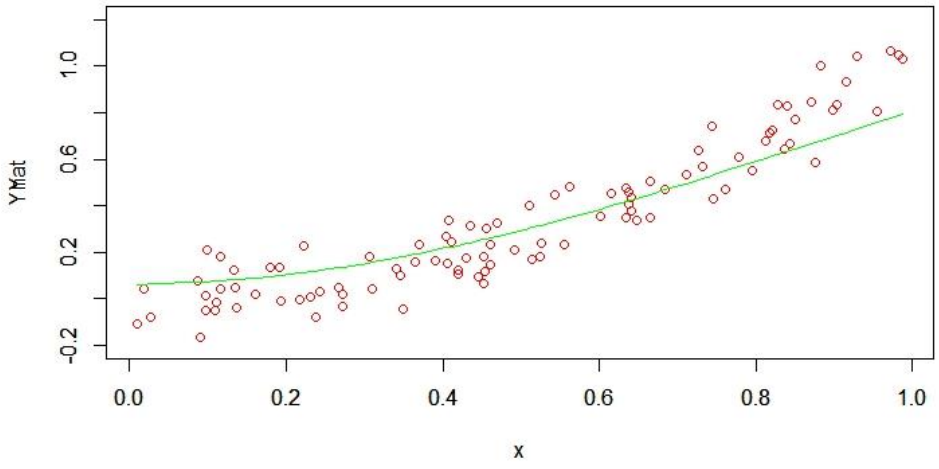
Lambda = 0.1



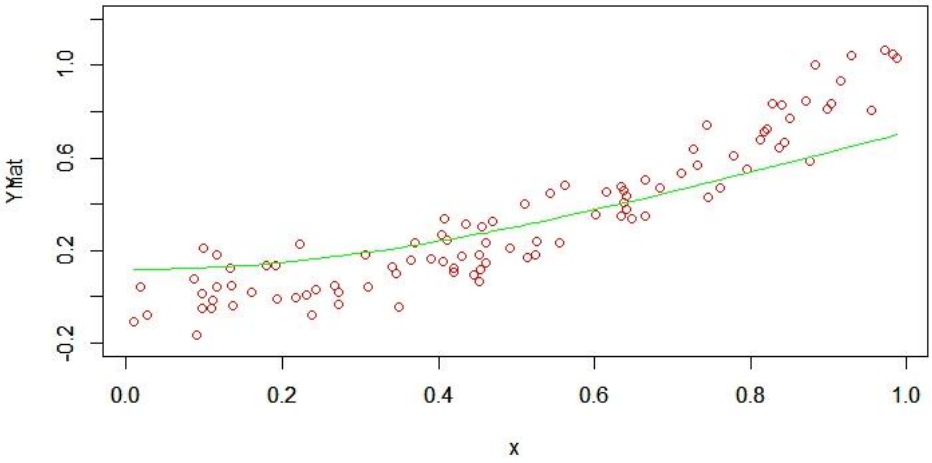
Lambda = 1



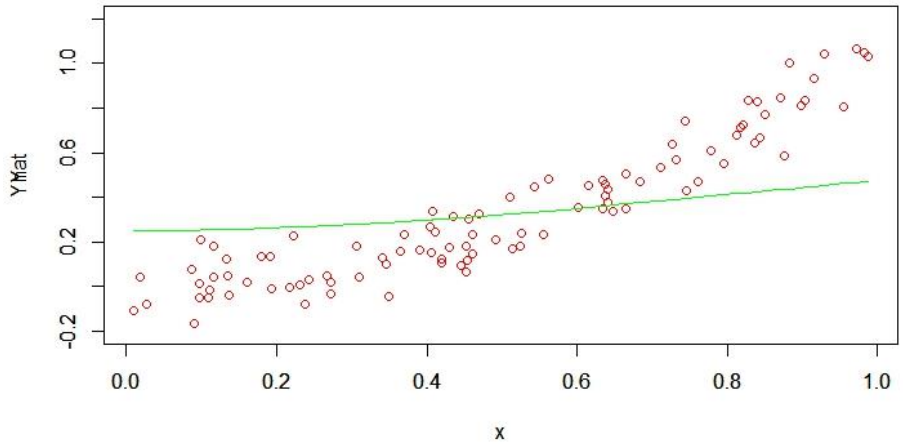
Lambda = 10



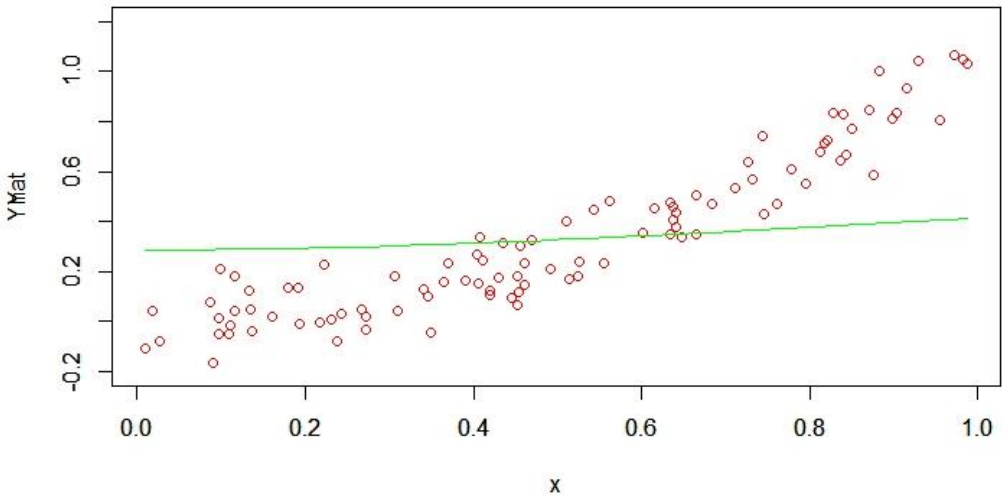
Lambda = 50



Lambda = 100



Lambda = 500



Lambda = 1000