

Stats 202A

Assignment 6

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Performance Evaluation

Parameters

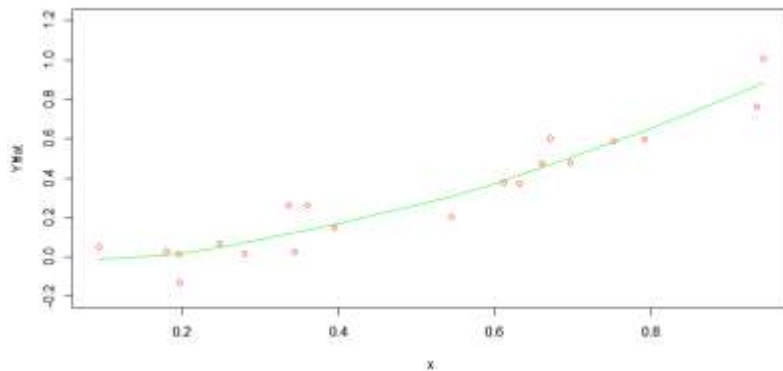
$n = 20$
 $p = 500$
 $\lambda = 1$

Sweep using R

Output:

```
[1] "R"
```

Time difference of 4.942058 mins

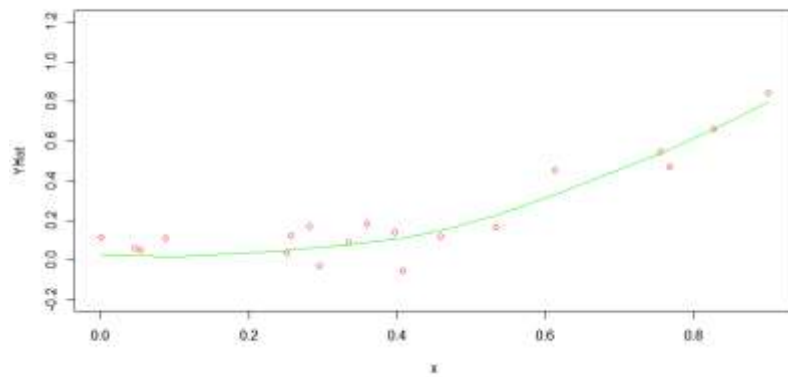


Sweep Using RCPP

Output:

```
[1] "RCPP"
```

Time difference of 0.368597 secs

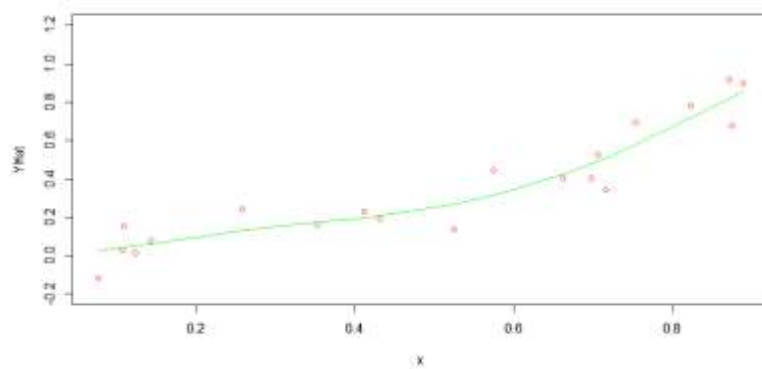


QR using R

Output:

[1] "R"

Time difference of 2.542975 secs

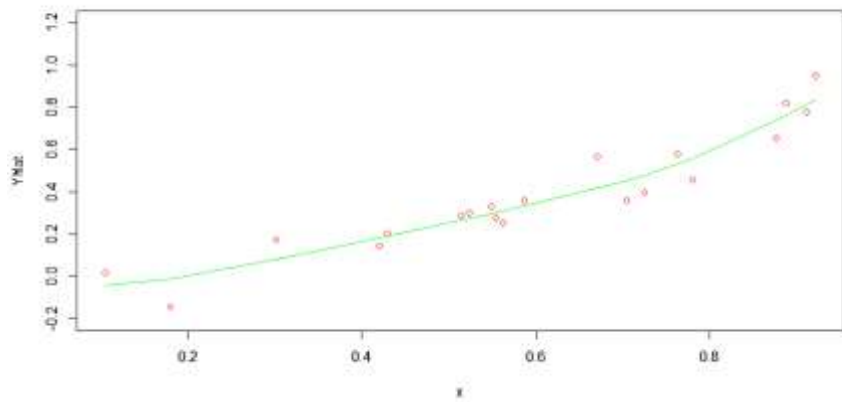


QR using RCPP

Output:

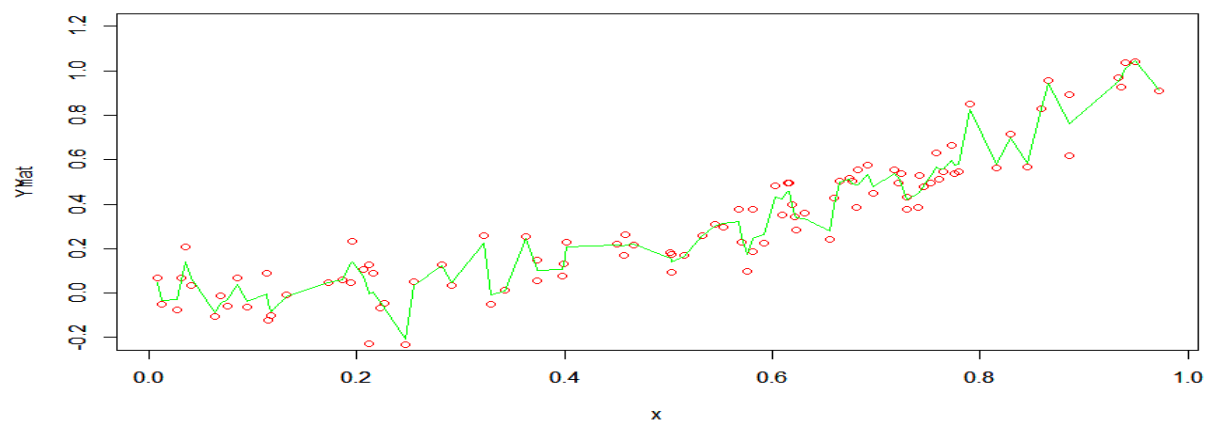
[1] "RCPP"

Time difference of 1.282547 secs

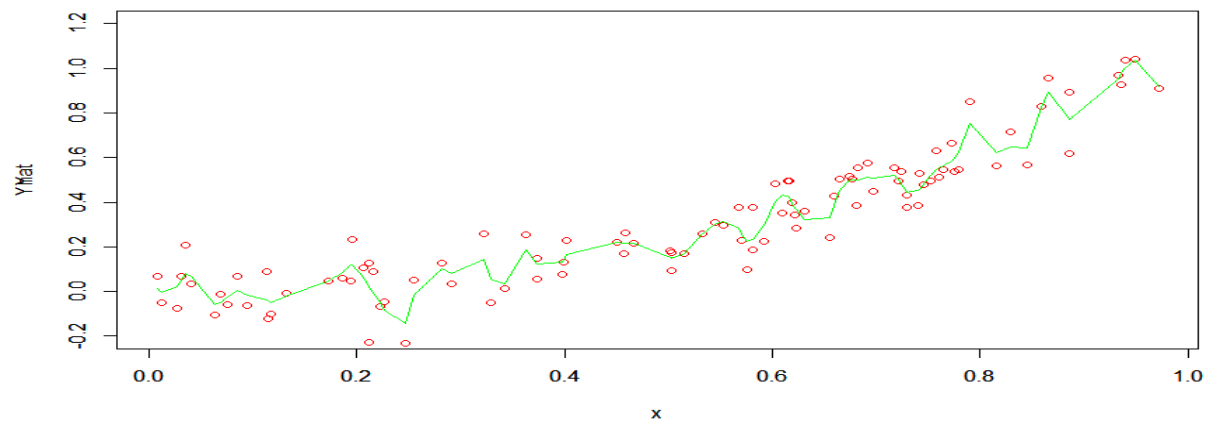


Plots of learned spline curves for different values of lambda

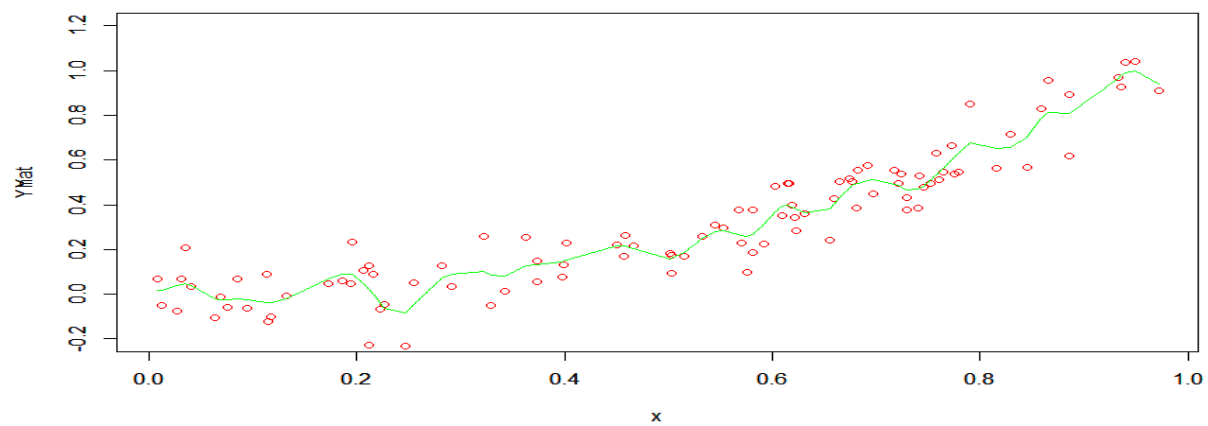
Lambda = 0.00001



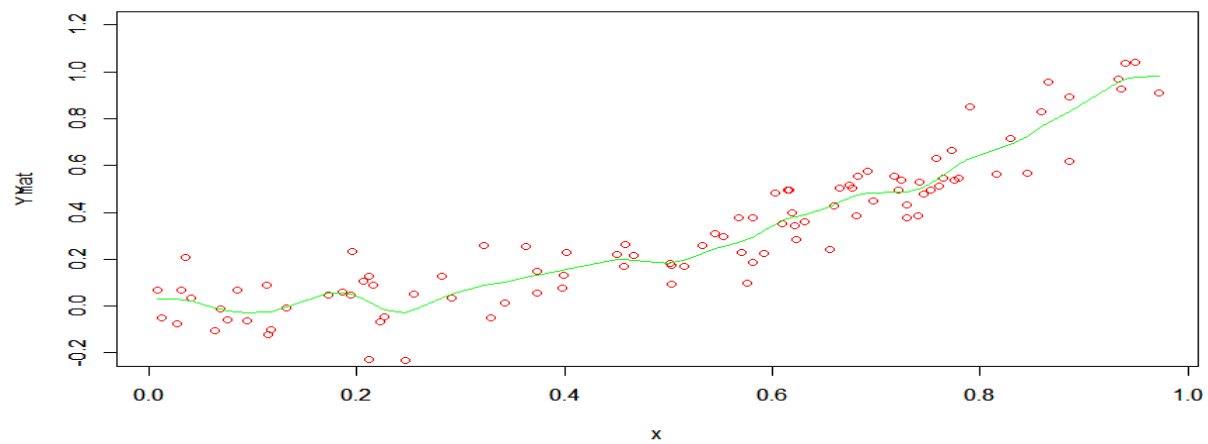
Lambda = 0.0001



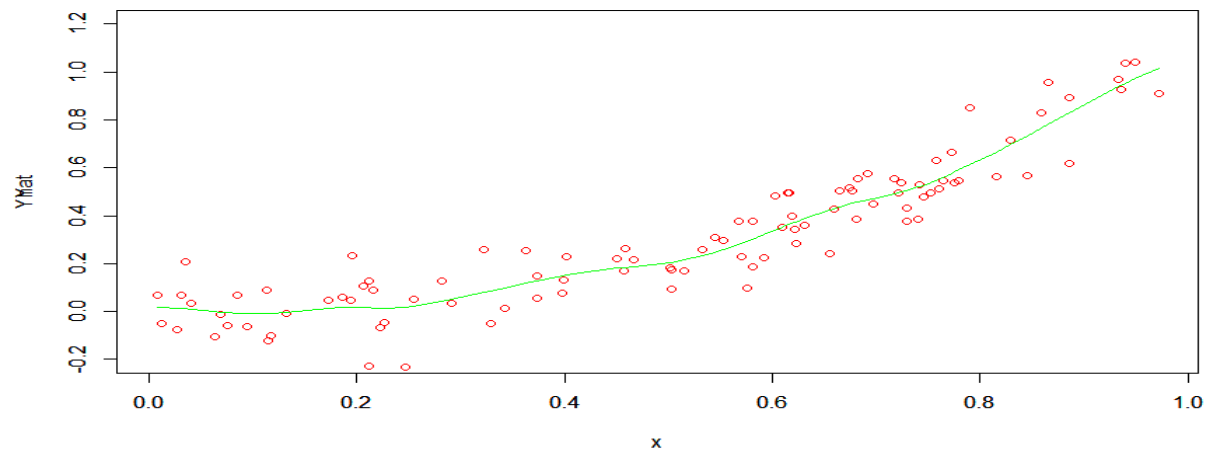
Lambda = 0.001



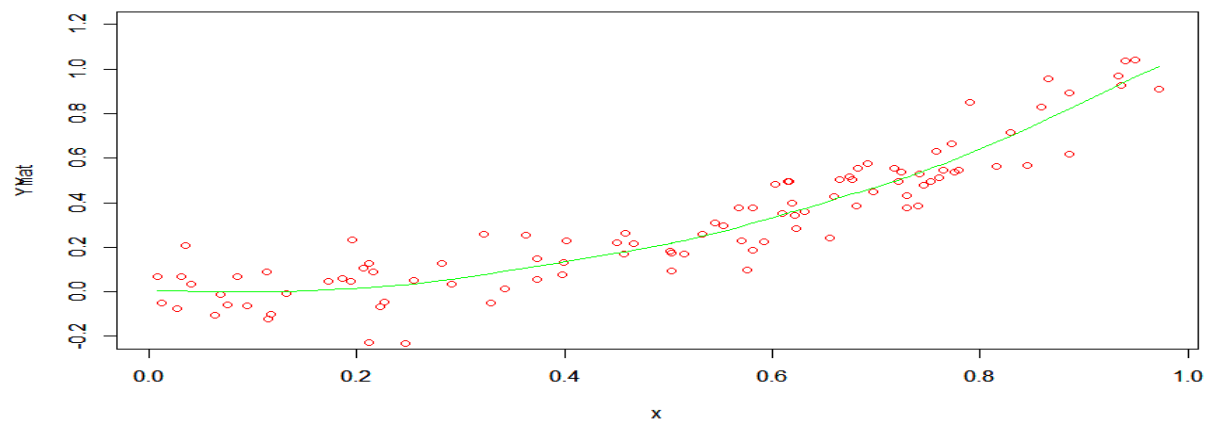
Lambda = 0.01



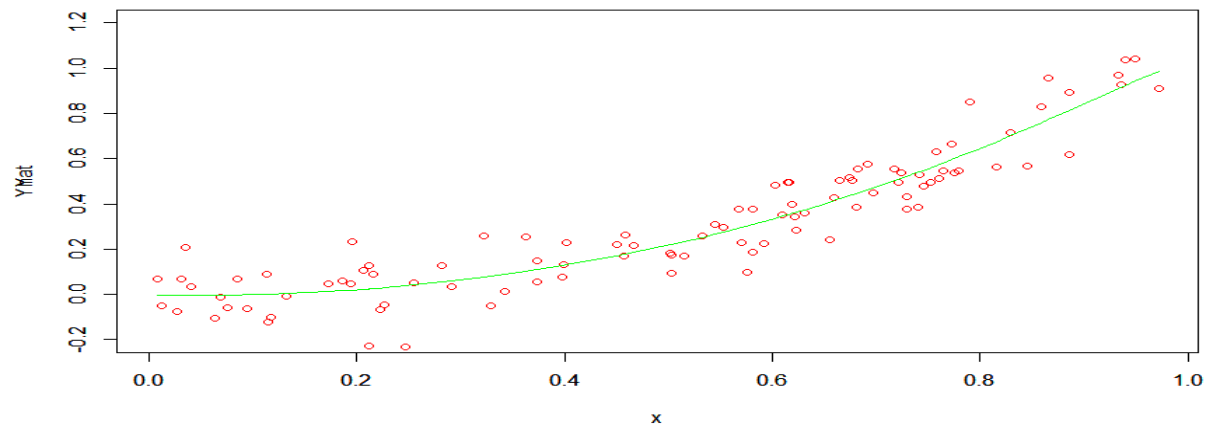
Lambda = 0.1



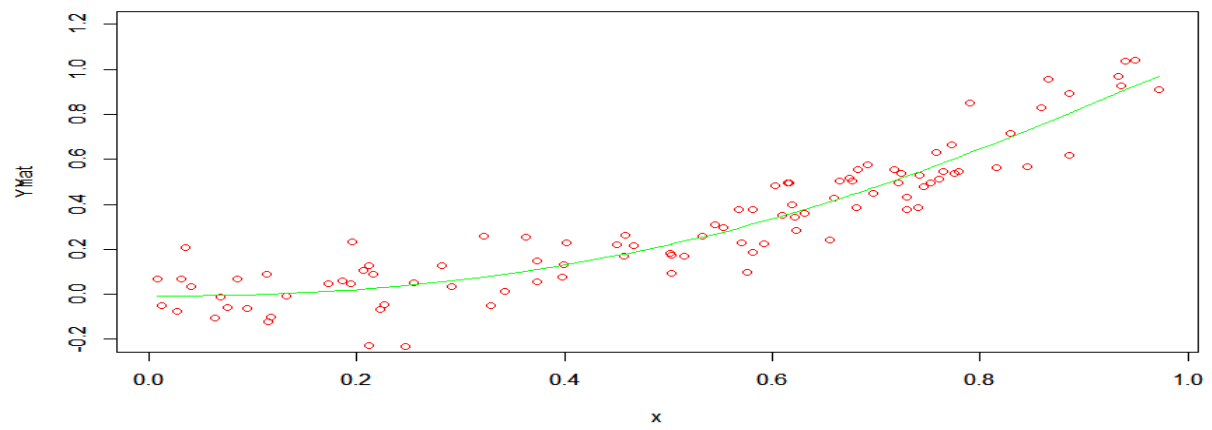
Lambda = 1



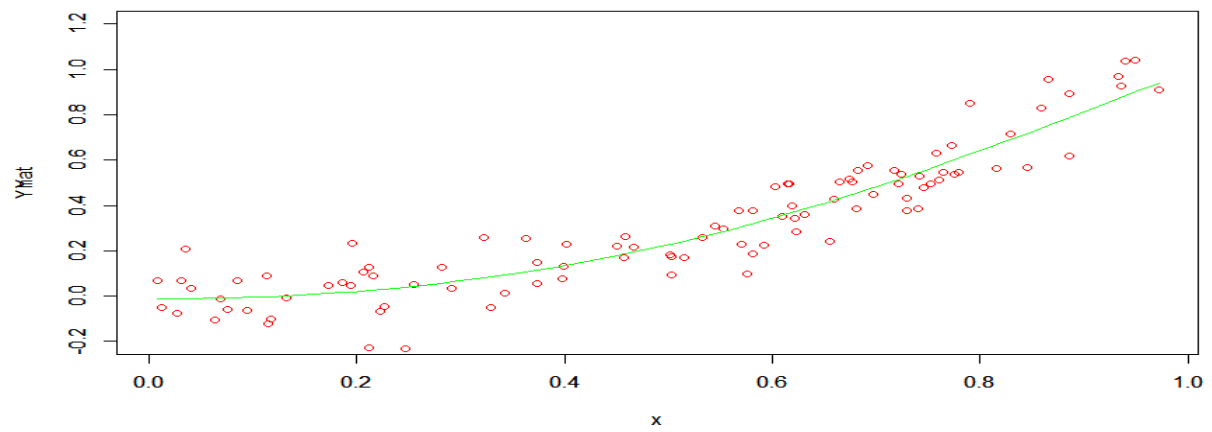
Lambda = 5



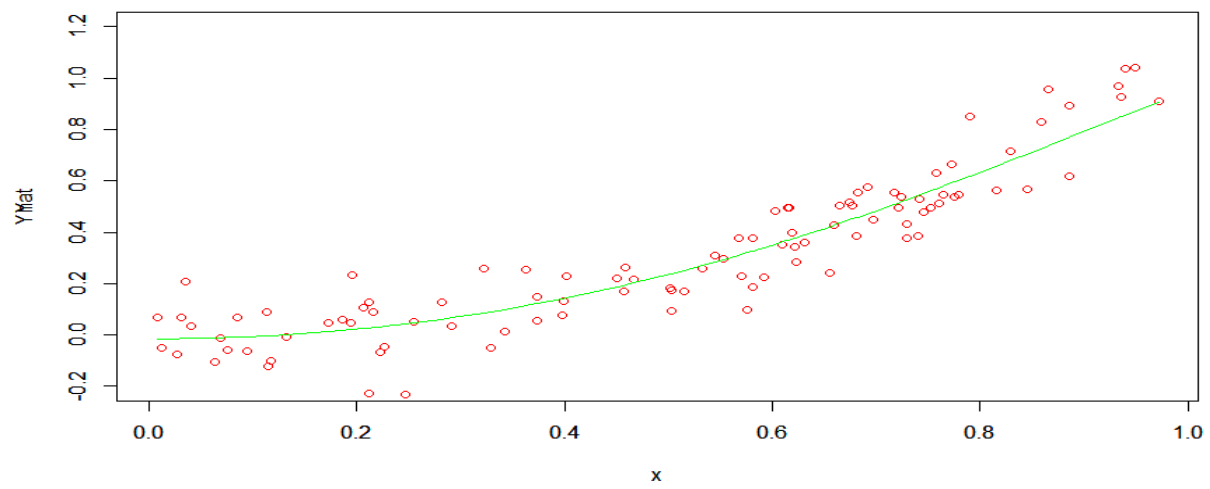
Lambda = 10



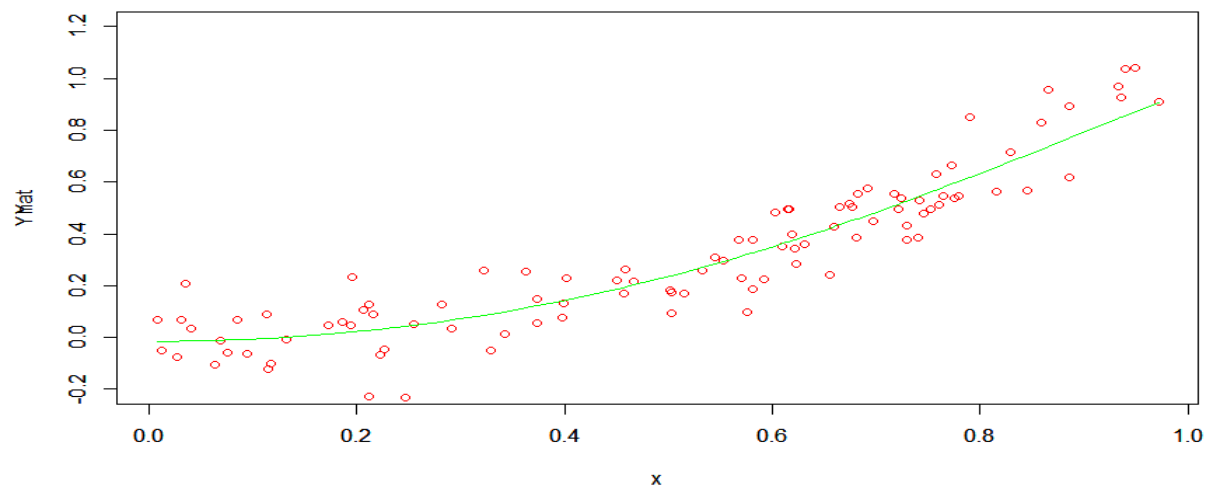
Lambda = 25



Lambda = 50



Lambda = 100

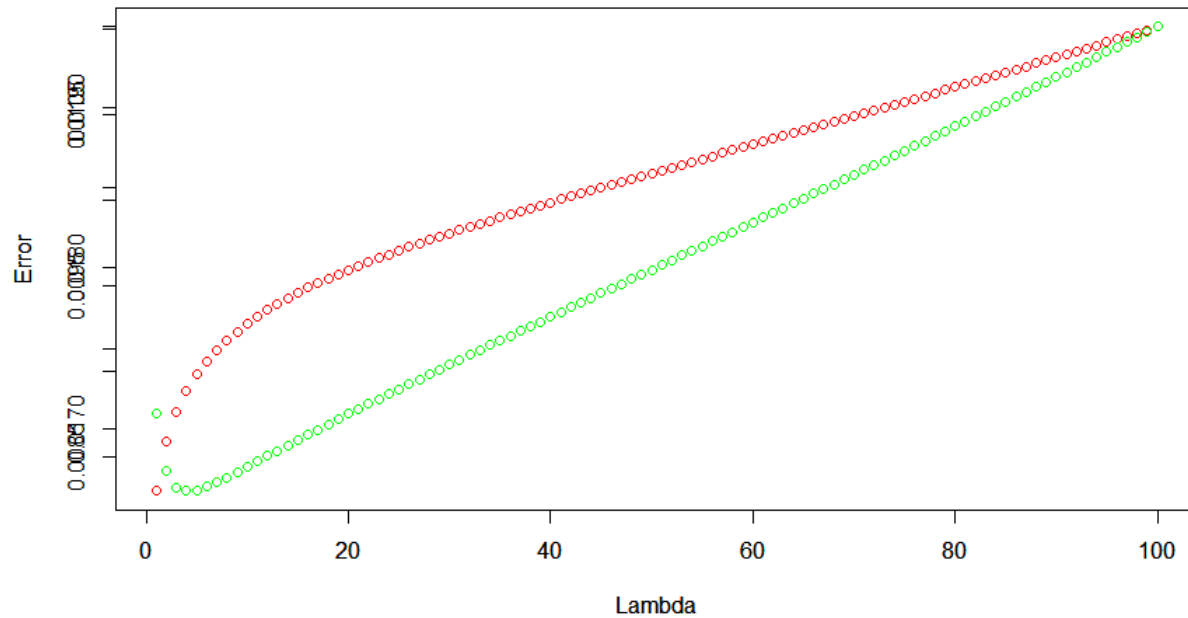


Training and Testing Plots for Spline Curve

Parameters

$n = 50$

$p = 1000$



Green = Testing Error

Red = Training Error

When the value of Lambda is low, the model is overfitting the data and hence the value of training error is low. Later, the model improves. With large values of Lambda, the training and testing error increases due to underfitting.