Solutioin By GLM

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```
train <- matrix(scan("train.txt"), 500, 51)
test  <- matrix(scan("test.txt"), 500, 51)
x <- train[,-51] ; y <- train[,51]
x.test <- test[,-51] ;  y.test <- test[,51]
```

```
library(glmnet)
```

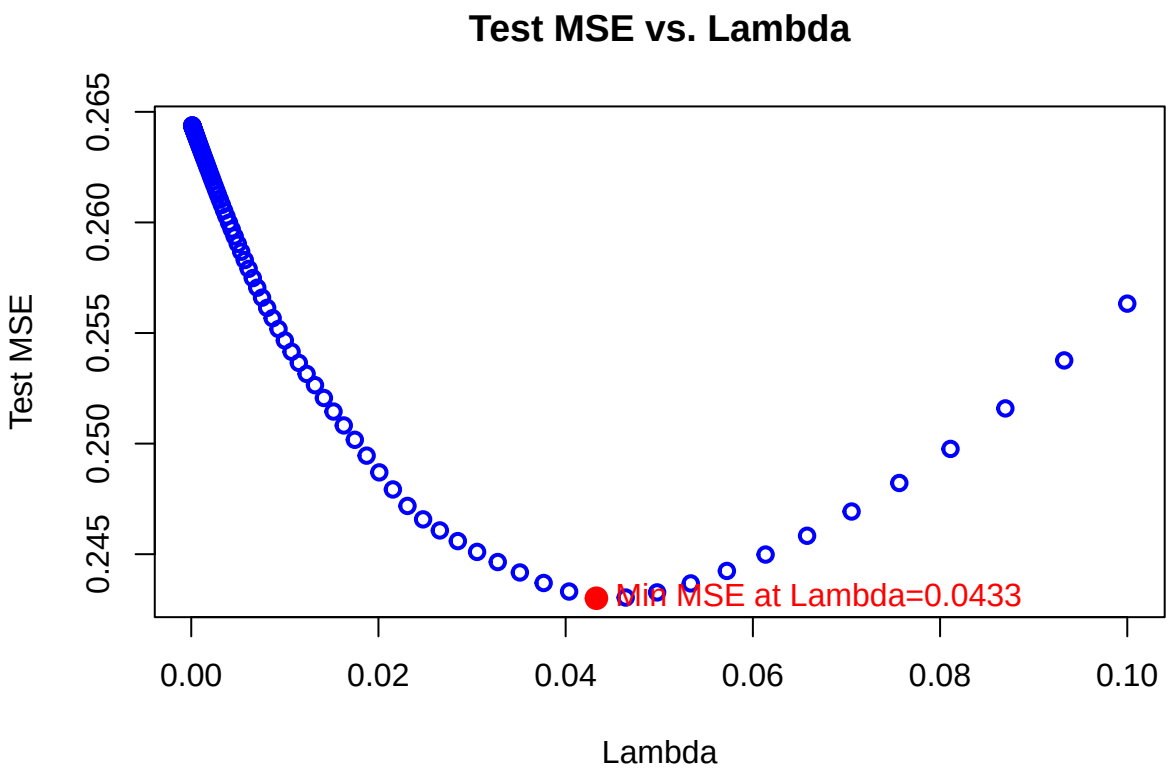
```
## Loading required package: Matrix
```

```
## Loaded glmnet 4.1-8
```

```
lambda_values <-10^seq(-4, -1, length.out =100)
mse_list <- numeric(length(lambda_values))

for (i in seq_along(lambda_values)) {
  model <- glmnet(x, y, alpha=0.5, standardize =  F,  lambda=lambda_values[i])
  y_pred<- predict(model, s=lambda_values[i], newx=x.test)
  mse_list[i] <- mean((y.test - y_pred)^2)
}

min_mse_idx <- which.min(mse_list)
lambda_min <- lambda_values[min_mse_idx]
min_mse <- mse_list[min_mse_idx]

cat("\nLambda_Min:", lambda_min, "\nMin_MSE:", min_mse)
```

```
##
## Lambda_Min: 0.04328761
## Min_MSE: 0.2430086
```

```
# MSE vs Lambda graph
plot(lambda_values, mse_list, col = "blue", lwd = 2,
     xlab = "Lambda", ylab = "Test MSE", main = "Test MSE vs. Lambda")
points(lambda_min, min_mse, col = "red", pch = 19, cex = 1.5)
text(lambda_min, min_mse, labels = sprintf("Min MSE at Lambda=%.4f", lambda_min), pos = 4, col = "red")
```


Test MSE vs. Lambda
Test MSE
0.245
0.250
0.255
0.260
0.265
0.00
0.02
0.04
0.06
0.08
0.10
Lambda
Min MSE at Lambda=0.0433