126 Data Project, Step 4

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```
##
## Call:
## lm(formula = RUNS ~ HOME_RUNS + SINGLES + WALKS + STOLEN_BASES,
##     data = batting)
##
## Residuals:
##      Min       1Q   Median       3Q      Max
## -124.140   -8.110   -0.528    6.956   88.759
##
## Coefficients:
##               Estimate Std. Error t value Pr(>|t|)
## (Intercept)  -0.781728   1.280636   -0.61    0.542
## HOME_RUNS     0.977261   0.031560   30.96   <2e-16 ***
## SINGLES       0.400909   0.007306   54.87   <2e-16 ***
## WALKS         0.268561   0.013396   20.05   <2e-16 ***
## STOLEN_BASES  0.490476   0.028537   17.19   <2e-16 ***
## ---
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
##
## Residual standard error: 21.6 on 495 degrees of freedom
## Multiple R-squared:  0.9925, Adjusted R-squared:  0.9925
## F-statistic: 1.642e+04 on 4 and 495 DF,  p-value: < 2.2e-16
```

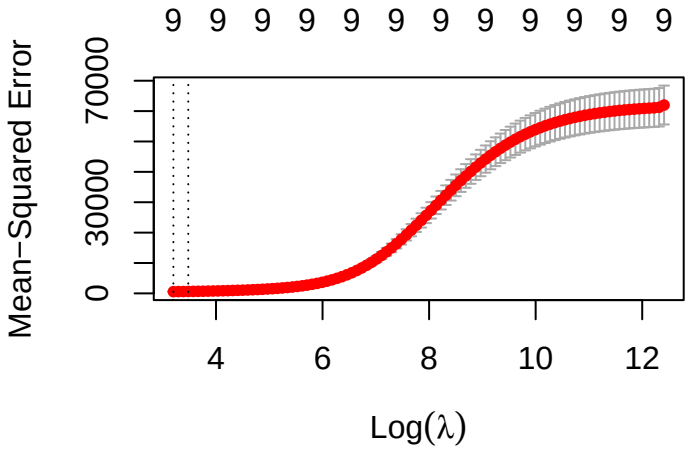
Ridge Regression

Fit the Ridge Regression Model

```
##           Length Class     Mode
## a0        100    -none-    numeric
## beta      900    dgCMatrix S4
## df        100    -none-    numeric
## dim         2    -none-    numeric
## lambda    100    -none-    numeric
## dev.ratio 100    -none-    numeric
## nulldev     1    -none-    numeric
## npasses     1    -none-    numeric
## jerr        1    -none-    numeric
## offset      1    -none-    logical
## call        4    -none-    call
## nobs        1    -none-    numeric
```

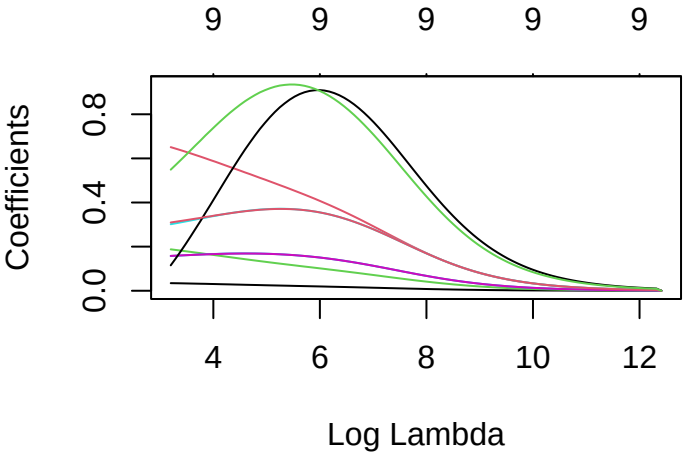
Choose an Optimal Value for Lambda

```
## [1] 24.53741
```



The lambda value that minimizes the test MSE is 24.53741.

Analyze Final Model




```
## [1] 0.9913522
```

The R-Squared is 0.9914, so the best model explains 99.14% of the variation in the response values.

LASSO

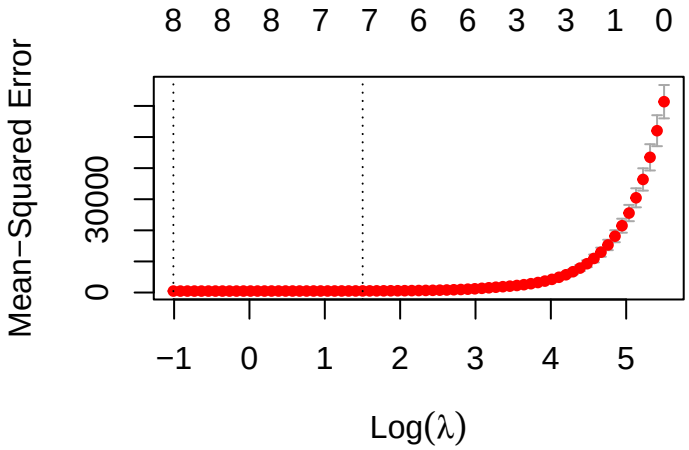
Fit the Lasso Regression Model

```
##           Length Class     Mode
## a0         71    -none-    numeric
## beta      639    dgCMatrix S4
## df         71    -none-    numeric
```

```
## dim         2    -none-    numeric
## lambda     71    -none-    numeric
## dev.ratio  71    -none-    numeric
## nulldev     1    -none-    numeric
## npasses     1    -none-    numeric
## jerr        1    -none-    numeric
## offset      1    -none-    logical
## call        4    -none-    call
## nobs        1    -none-    numeric
```

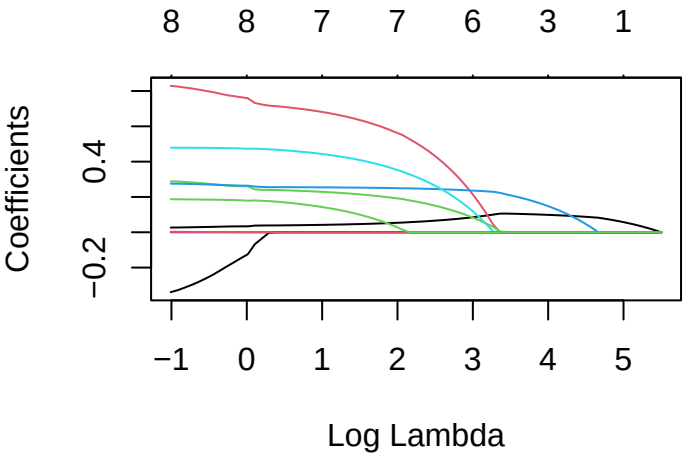
Choose an Optimal Value for Lambda

```
## [1] 0.3643727
```



The lambda value that minimizes the test MSE is 0.364.

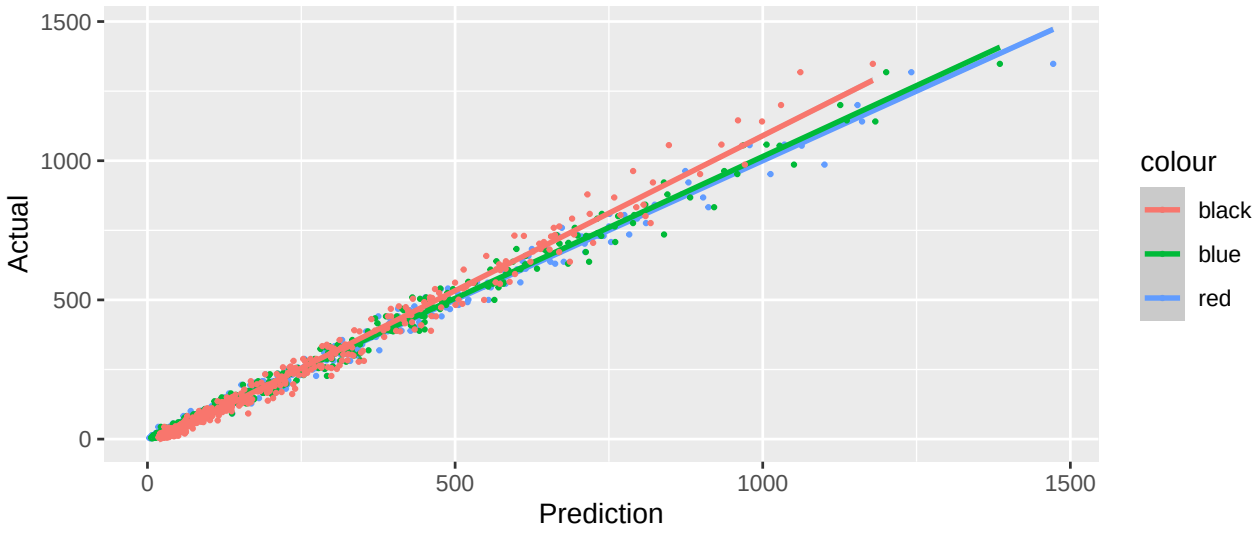
Analyze Final Model




```
## [1] 0.9935687
```

The R-Squared is 0.9936, so the best model explains 99.36% of the variation in the response values.

```
## [1] 0.3643727
```


1500
1000
500
0
Actual
0
500
1000
1500
Prediction
colour
black
blue
red