Model Comparison in Predicting Cholesterol Levels

P8106 Midterm Project
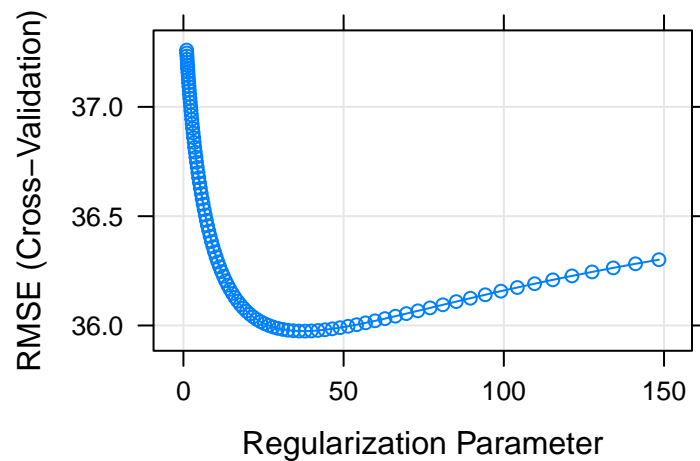
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Results and Analysis

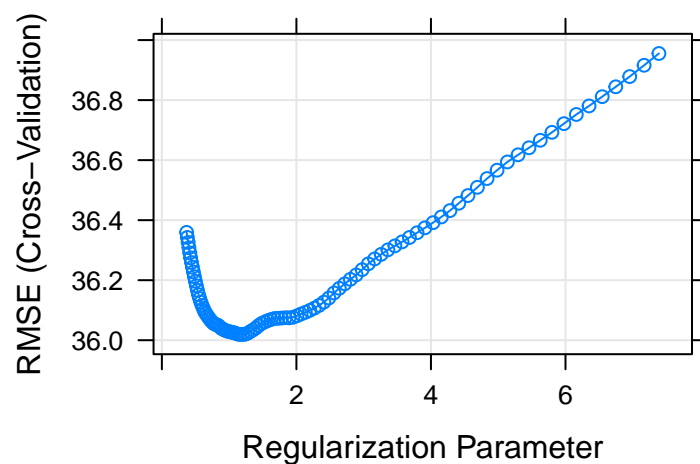**Linear Model**

Ridge Regression Model

### RMSE vs. Lambda for Ridge Regression

Lasso Model

RMSE vs. Lambda for Lasso Regression

As shown on the graph above, the value of lambda that gives the lowest RMSE value is 1.1635959. The lasso model at this value of lambda gives 40 variables in the final model, which can then be used to predict cholesterol levels. With this value of lambda, the lasso model gives an MSE of 965.5090291.
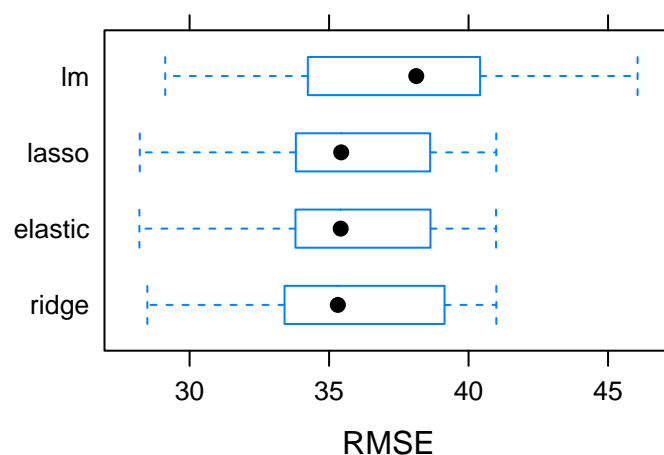
Elastic Net Model

RMSE vs. Lambda for Elastic Net
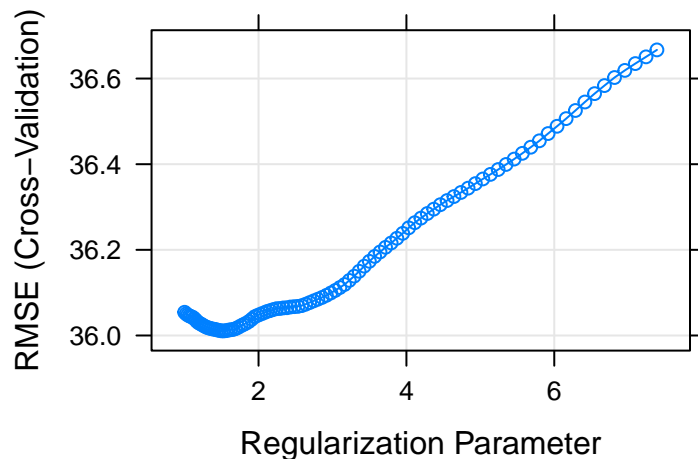
As shown in the graph above, the elastic net model with an alpha of 0.75 has the lowest RMSE at a lambda value of 1.5284321. This combination of alpha and beta gives a model that contains 41 predictors in the final model. This model is then used to predict the cholesterol level and compared to the test data. Prediction of cholesterol levels using the elastic net model gives an MSE of 966.9695486.

Model Comparison

RMSE comparison of 4 Models

The box plot shows that the model created using the elastic net gives the lowest RMSE among the four models created for the purpose of predicting cholesterol levels. Therefore, the elastic model should be chosen when using 632 bootstrap as the cross validation method to predict cholesterol levels.

Conclusion