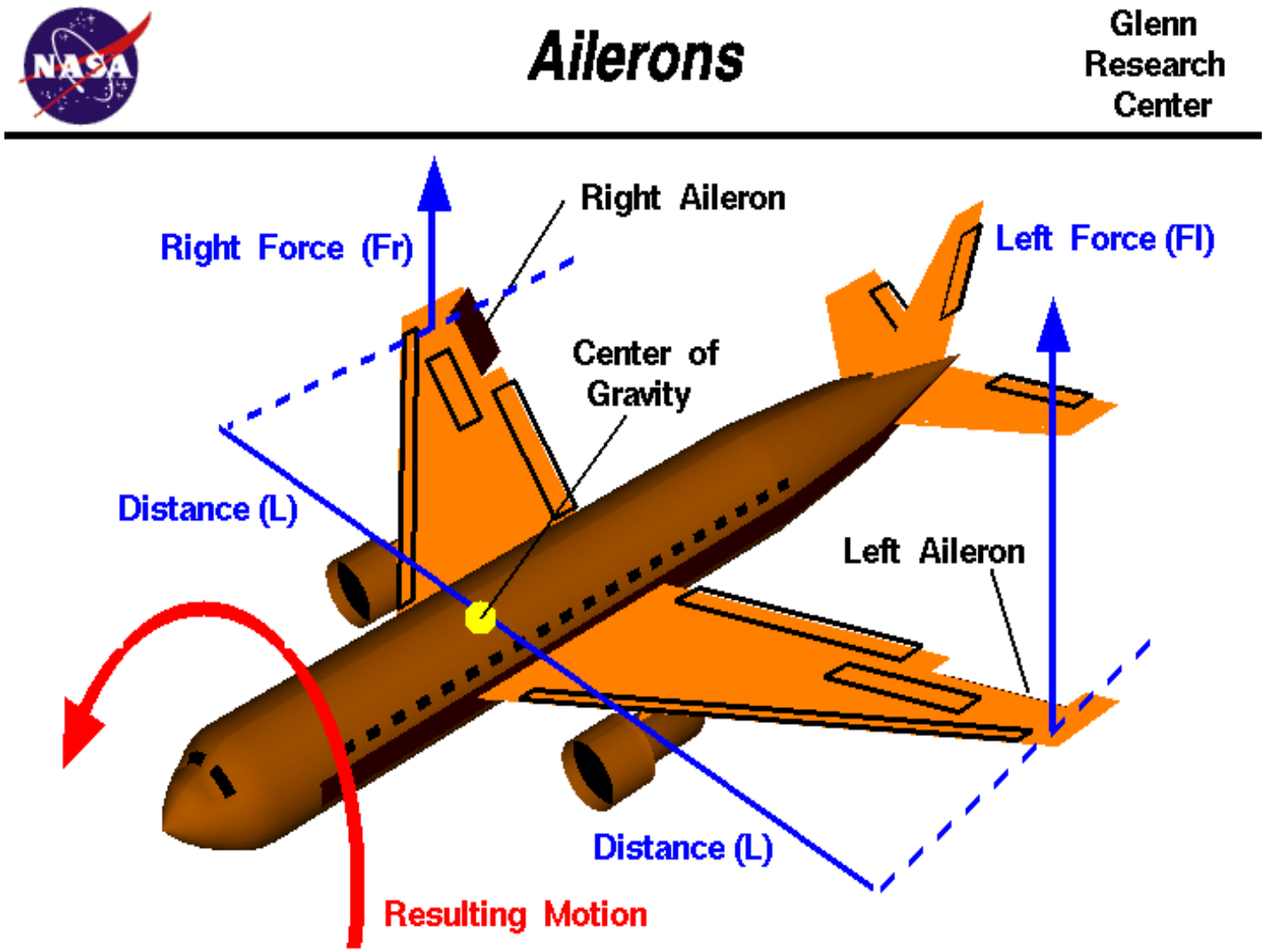


Ailerons

MICHAEL AYEDUN

ERIK CARRION

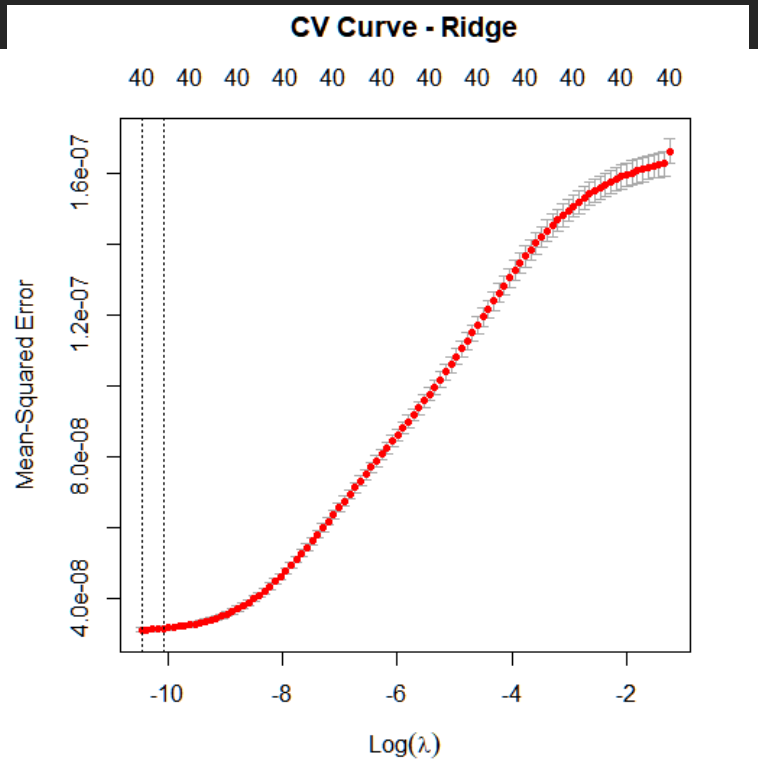
Data Description

Goal: Predict the control action of the aircraft's ailerons - reverse engineer human control skills to serve as a model for an auto-pilot system

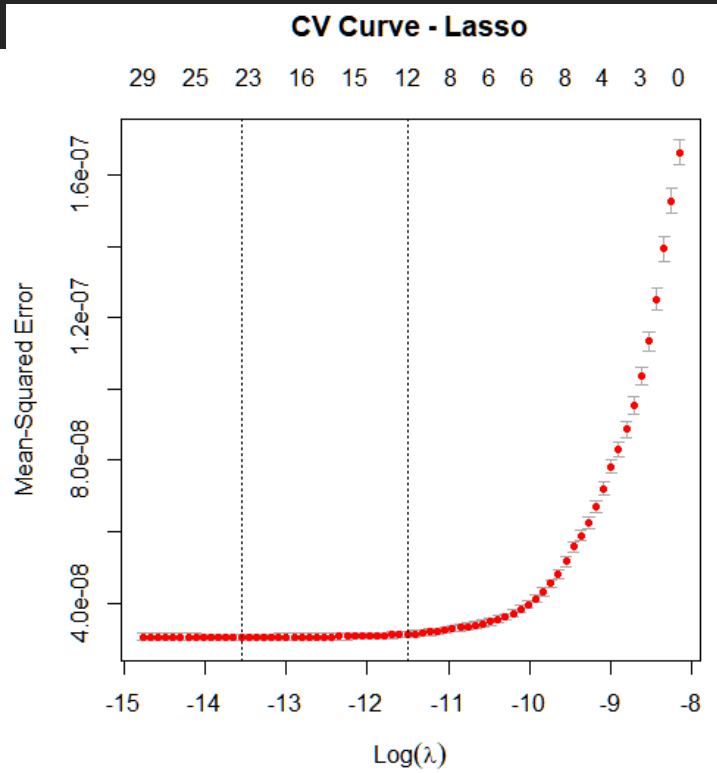
Data Set:

- 13,750 observations
- 40 Predictors – represent the state of the aircraft
- No missing values
- No categorical variables

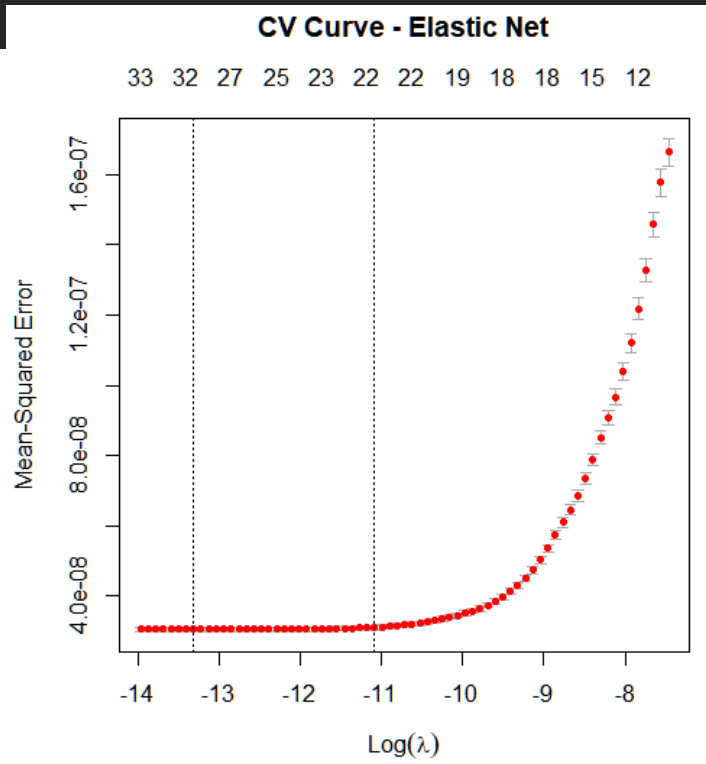
Cross Validation Curves



Run Time: .406 seconds

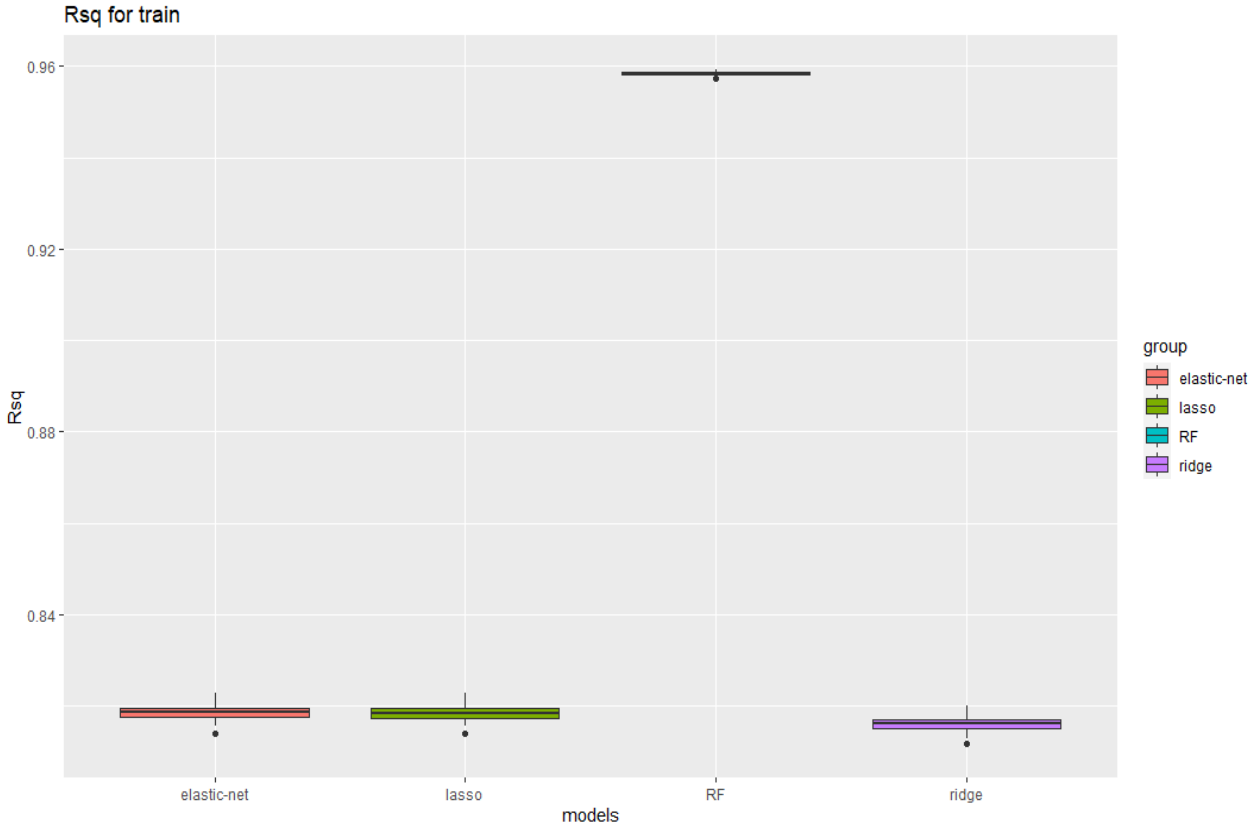


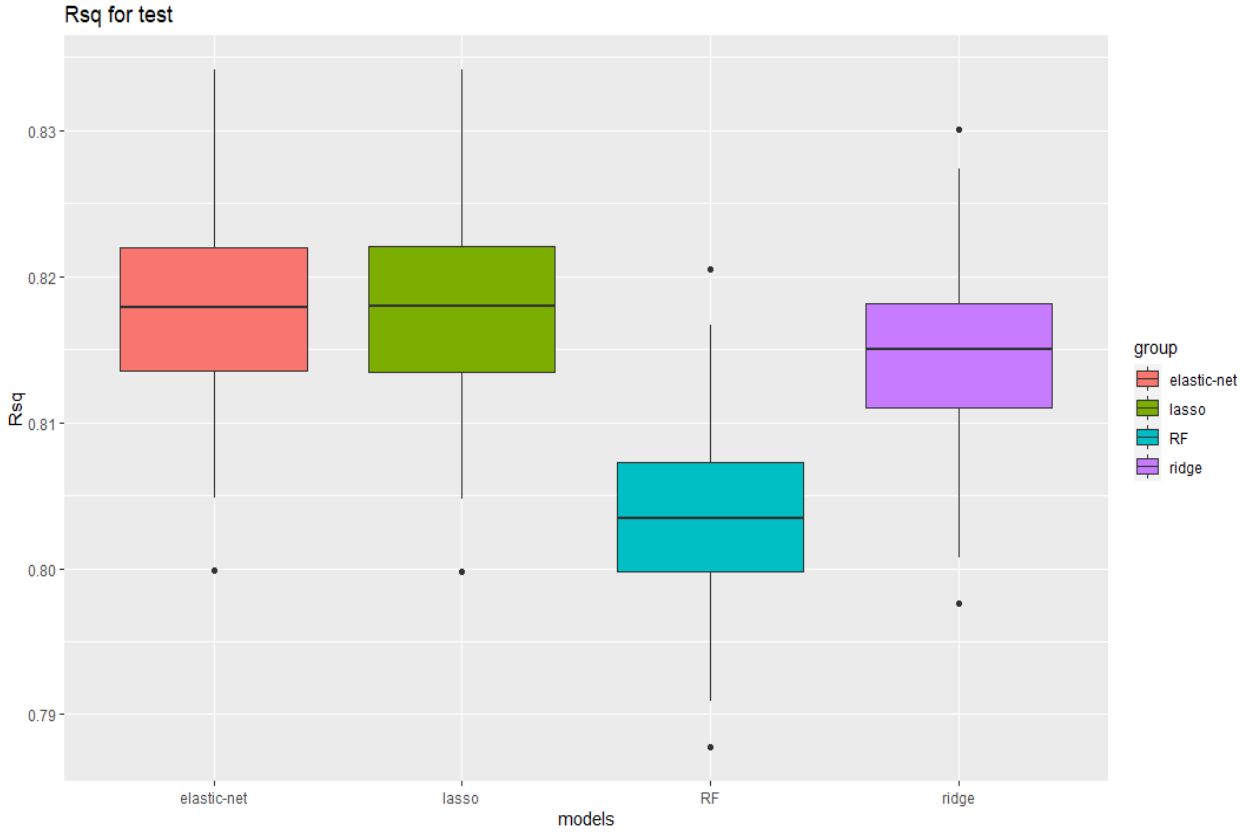
Run Time: .343 seconds



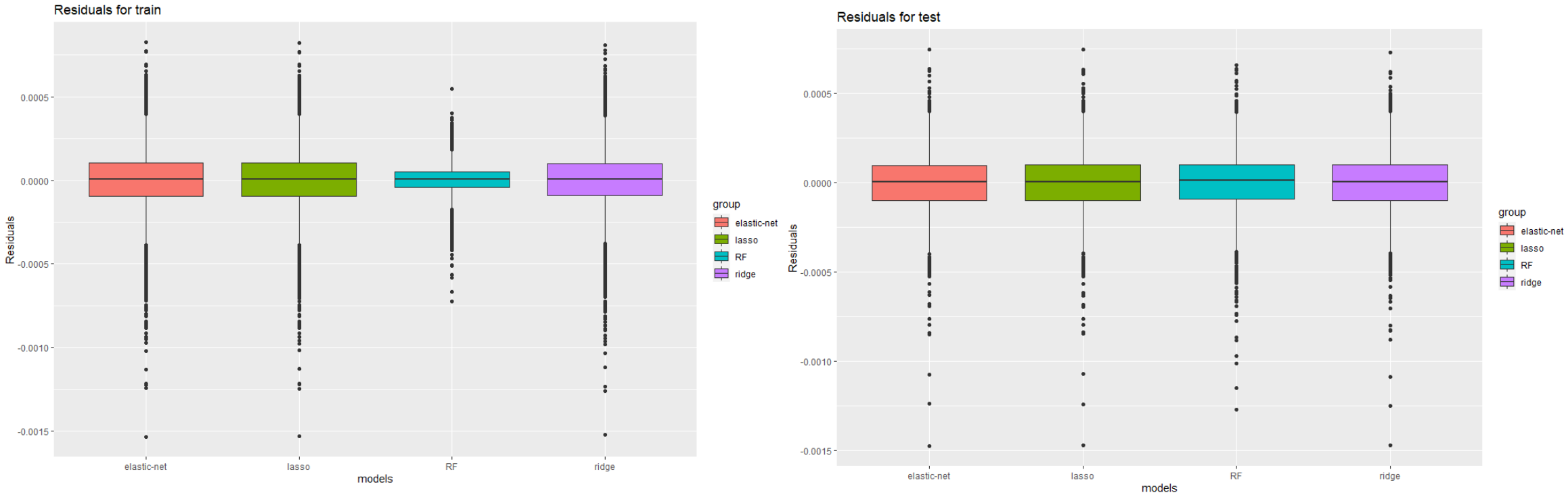
Run Time: .317 seconds

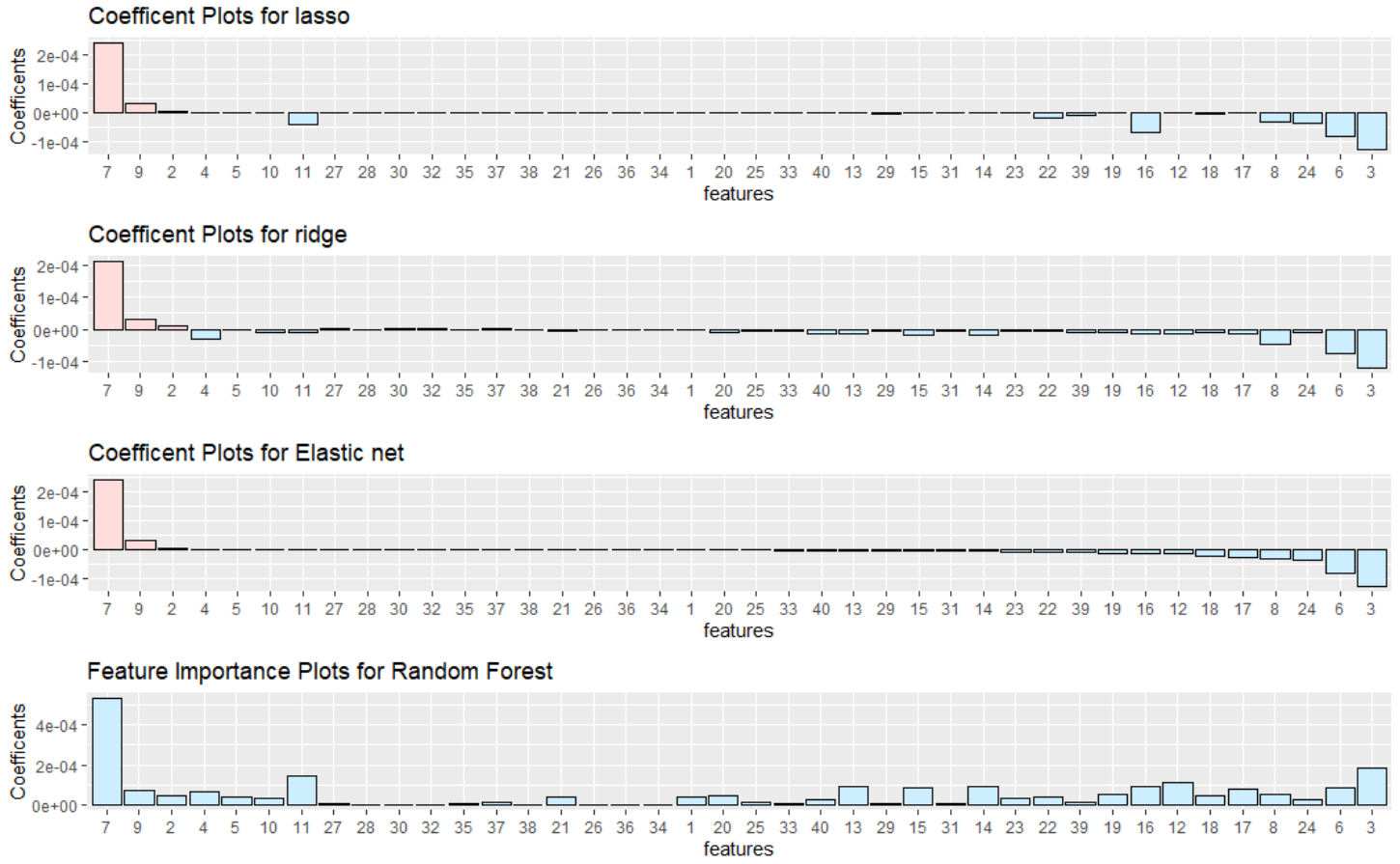
R^2 Boxplots for Training and Test Data





Residual Boxplots for Training and Test Data





Important Variables

- 7, 3, & 6 : absRoll, p, curRoll
- No Dictionary – Interpretation Difficult

Accuracy vs. Run Time

METHOD	90% R^2 INTERVAL	FULL FIT TIME
Ridge	.8066 - .8220	0.42
Lasso	.8096 - .8254	0.33
Elastic Net	.8096 - .8255	0.35
Random Forest	.7950 - .8160	116.98

Concluding Remarks

- Random Forest – Tends to overfit, very slow. Multicollinearity an issue.
- Lasso, Ridge, Elastic Net – Solid performance. Reduced Variance at the cost of added bias
- Next Steps :
  - Refine the Ridge, Lasso, or Elastic Net Model.