

What is the optimal value of alpha for ridge and lasso regression? What will be the changes in the model if you choose double the value of alpha for both ridge and lasso? What will be the most important predictor variables after the change is implemented?

The Optimal value of lambda/ alpha in ridge and lasso regression varies on a case by case basis. We change the hyperparameter alpha in iterations to arrive at the most efficient model. Lower values of alpha will have less regularization and hence will be close to the original linear regression model. This could indicate multicollinearity and overfitting. As alpha increases, the curve/ fitting is smoothened. But when alpha increases beyond a certain point, the model loses the underlying patterns and will not be able to predict test data.

When the alpha is doubled, slope of regression line will reduce. And it will become more and more horizontal.

How can you make sure that a model is robust and generalisable? What are the implications of the same for the accuracy of the model and why?

To make a model more robust and generalisable, its performance on test data should be comparable to the performance on training data. The underlying patterns should be recognised. At the same time, noise in data should be ignored. The model evaluation via RMSE, MSE and  $R^2$  values help in checking the model accuracy.