

Advanced Regression Assignment

Question 1: What is the optimal value of alpha for ridge and lasso regression? What will be the changes in the model if you choose to double the value of alpha for both ridge and lasso? What will be the most important predictor variables after the change is implemented?

Answer: Optimal Value of alpha for ridge and lasso regression are below:

- Optimal Value of lambda for Ridge: 10
- Optimal Value of lambda for Lasso: 0.001

If we choose to double the value of alpha for both ridge and lasso:

In case of ridge that will lower the coefficients and in case of Lasso there would be more less important features coefficients turning 0.

The most important predictor variable after the change is implemented are those which are significant.

Question 2: You have determined the optimal value of lambda for ridge and lasso regression during the assignment. Now, which one will you choose to apply and why?

Answer: Optimal Value of alpha for ridge and lasso regression are:

- Optimal Value of lambda for ridge: 10
- Optimal Value of lambda for Lasso: 0.001

As we got good score for both the models so we can go with Lasso regression as it results in model parameters such that lesser important features coefficients become zero.

Ridge: Train: 90.9 Test: 87.4 and Lasso: Train: 89.8 Test: 86.4

Question 3: After building the model, you realized that the five most important predictor variables in the lasso model are not available in the incoming data. You will now have to create another model excluding the five most important predictor variables. Which are the five most important predictor variables now?

Answer: On running the same notebook and removing the top 5 significant

variables: We found below variables as next 5 significant.

-Lasso

```
('GarageType_BuiltIn', 0.089),  
( 'GarageType_Detchd', 0.094),  
( 'GarageType_No Garage', 0.101),  
( 'GarageType_Others', 0.12),  
( 'GarageFinish_No Garage', 0.195)]
```

-Ridge

```
('GarageType_BuiltIn', 0.089),  
( 'GarageType_Detchd', 0.093),  
( 'GarageType_No Garage', 0.096),  
( 'GarageType_Others', 0.103),  
( 'GarageFinish_No Garage', 0.14)]
```

Question 4: 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?

Answer: The model should be generalized so that the test accuracy is not lesser than the training score. The model should be accurate for datasets other than the ones which were used during training. Too much importance should not give to the outliers so that the accuracy predicted by the model is high. To ensure that this is not the case, the outliers analysis needs to be done and only those which are relevant to the dataset need to be retained. Those outliers which it does not make sense to keep must be removed from the dataset. If the model is not robust, it cannot be trusted for predictive analysis.