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 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 alpha for ridge is 20 and for lasso it is 0.001.
- The changes are as follows

• Model Evaluation : Ridge Regression, alpha=40.0 • R2 score (train) : 0.9151 • R2 score (test) : 0.8775 • RMSE (train) : 0.1145 • RMSE (test) : 0.1462	• Model Evaluation : Ridge Regression, alpha=20.0 • R2 score (train) : 0.9158 • R2 score (test) : 0.8770 • RMSE (train) : 0.1141 • RMSE (test) : 0.1465
• Model Evaluation : Lasso Regression, alpha=0.002 • R2 score (train) : 0.9141 • R2 score (test) : 0.8812 • RMSE (train) : 0.1152 • RMSE (test) : 0.144	• Model Evaluation : Lasso Regression, alpha=0.001 • R2 score (train) : 0.9150412783502796 • R2 score (test) : 0.8800077292923839 • RMSE (train) : 0.11456421178980816 • RMSE (test) : 0.1446989563517844

- The important predictor remains the same **1stFlrSF**

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?

As we can see from the R2 values of Ridge and Lasso, Lasso has a marginally higher test R2 hence selected lasso regression.

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?

- The 5 Important predictor variables are as follows: '1stFlrSF', '2ndFlrSF', 'OverallQual', 'OverallCond' 'SaleCondition_Partial'.
- FullBath, BsmtFinSF1, HalfBath, GarageArea, ExterQual

Question 4

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

The model can be robust and generalizable if we build it by taking care of outliers in the training data.

Scaling or Selection of the data in order to have all the features in the similar scale.

Feature engineering by clubbing similar data together which can give us more insight.

Transformation of the data so that it is following the similar pattern across all the features.