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?

A. Optimal values of alpha for rigid is 20. Optimal value for Lasso is 500.
As the optimal value is doubled the coefficient variables values are decreasing.
As the matter of fact the value of coefficients decreases the smother will be the curve.
The higher value of coefficients means rate of change of values is more like variance is more.
For our case as increase in optimal value the coefficients decreases. The variance will decreased.
Roof Material will be the important predictor after change.

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?

A. We figured out the optimal values of the lambda(alpha) for ridge and lasso regularization as 20 and 500.
As the Number of coefficients are about 200+ like considering 200+ variables to predict the target variable in Ridge regression we will get all coefficients only few coefficients are near to zero. Which will increase the Computational cost of the model.
For Lasso Regression only few coefficients are having the values most of coefficients are becomes zero. Feature selection also happens in the Lasso regression. So I will prefer the **Lasso Regression** for modeling.

3. After building the model, you realised 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?

A. Roof Material.Kitchen Qality, Home functionality,1st floor Square Feet,Sales type condition are the 5 predictors of building the model which will gives the target variable,
If the five variables are not passed in input csv file next parameters it will work on will be Neighberhood, BsmtQual, GarageQual, SaleCondition_Partial,Exterior these variables are used for building the model.

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?

A. Linear Regression model is we can make robust and generalizable when the variance and bias of the model are at optimal point. Optimal point can be detected by L2 minimization (Ridge) and L-1 Minimization (Lasso). With help of these minimization algorithms, we have found the optimal Lambda value. After detecting the lambda we have applied to model and calculated the metrics r2_score , Mean Square error which give the accuracy of the model and performance of the model.
Model is said to be robust when it is able to predict values of target values for unseen data.
If the difference for actual value to predict value is very less means it is performing very accurately. The Mean Square Error will give the idea of Accuracy of model if it is low accuracy is high and if it is high low accuracy.
Whenever we building model we will make sure line will fit and have least Mean Square Error.