

## 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?

- **ANSWER:**
- I've used GridSearch method to find the optimum alpha value ranging from 0.0001 to 1000
- Seeing the graph I've obtained optimum alpha for train and test sets where, its 15 for Ridge and 100 for Lasso
- When these values are doubled the model performance almost remains the same
- After doubling alpha the most important predictors in ridge:
  - Neighbourhood\_Northridge Heights
- After doubling alpha the most important predictors in Lasso:
  - Neighbourhood\_Northridge Heights

## 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:**
- Ridge and Lasso showed very similar results where:
- Ridge gave a train R2 score of 88.91 and test R2 score of 84.39
- Lasso gave a train R2 score of 89.84 and test R2 score of 85.75
- Here I decided to go with Lasso regression as it is slightly better

### Question 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?

- **ANSWER:** The next 5 important predictors are
- Ridge:
  - Kitchen Quality Good
  - Condition2 near positive off-site , greenbelt etc
  - Brick Face Exterior covering on the house
  - Neighbourhood Edwards
  - Basement Exposure to walkout - Good
- Lasso:
  - Sale Condition Allocation- two linked properties ,
  - Brick Face Exterior covering on the house
  - Kitchen Quality typical/average ,
  - Kitchen Quality Good ,
  - Neighbourhood Crawford

## 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?

- **ANSWER:**
- Train and test splitting is done in way so the model is not biased
- Avoiding to overfit the model which usually tends to makes it more robust and generalizable
- Grid search method helps us to find the optimum value of alpha making the model more accurate
- Hence generalizing the model improves the performance