# Topic : Advance Regression
# Subjective Questions

**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?

**Solution**

The optimal value of alpha for ridge and lasso regression

Ridge Alpha -9

Lasso Alpha -0.001

If we double the alpha value the following values will come :

For Ridge: Alpha - 18

-R2 Decrease in the train data

-RSS increases in both test and train data

-MSE for train data

For Lasso : Ridge - 0.002

-R2 decreases in train and test data

-RSS increases in both train and test data

-MSE increases in both train and test data

**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?

**Solution:**

The r2_score of ridge is slightly higher than lasso for the test dataset so we will choose ridge regression to solve this problem

But Lasso regression would be a better option it would help in feature elimination and the model will be more robust.

**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?

## 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?

- **Solution:**
- Robustness of a model implies, either the testing error of the model is consistent with the training error, the model performs well with enough stability even after adding some noise to the dataset. Thus, the robustness (or generalizability) of a model is a measure of its successful application to data sets other than the one used for training and testing.
- By the implementing regularization techniques, we can control the trade-off between model complexity and bias which is directly connected the robustness of the model. Regularization, helps in penalizing the coefficients for making the model too complex; thereby allowing only the optimal amount of complexity to the model.It helps in controlling the robustness of the model by making the model optimal simpler

- Accuracy and robustness may be at the odds to each other as too much accurate model can be prey to over fitting hence it can be too much accurate on train data but fails when it faces the actual data or vice versa.