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?

Optimal value of Alpha

- Ridge=0.2
- Lasso=100

If the value of Alpha is doubled then shrinking penalty will increases, so both in Ridge and Lasso will try to shrink values towards zero, so our model will be simpler. And this will eventually increase the bias and eventually decrease the variance.

Shrinking Penalty will be higher in Ridge regression as compared to Lasso since ridge regression uses sum of squares as shrinking penalty.

Important Predictor variable

Ridge- PoolQC_Gd

Lasso- GrLivArea

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?

According to Occam's Razor a model should not be much complex, based on that Lasso regression will be selected. Because Lasso will make the feature selection among the variables but whereas Ridge will not reduce columns it will consider all variables.

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?

The five most important predictor variables are:-

- PoolQC_Gd
- GrLivArea
- Condition2_PosN
- TotalBsmtSF
- OverallQual

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?

According to Occam's Razor – the model should be simple and not much complex because of the performance of model on unseen data.

- Simple models are usually are more generic and are more widely applicable.
- These models require less training samples for effective training than complex ones and are easier to train.
- Simple models are robust because they have low variance, high bias whereas complex models have low bias, high variance.
- Due to which complex models perform well on training and performs poor on testing.
- Hence for model to be robust and generalisable, model should be simple. Regularization is one of the methods for generalisation.

While making a model simple lead to Bias-Variance trade off happens in order to attain an accurate model there should be a balance between bias and variance and the same will be implied for the accuracy of the model. In the figure Optimum model complexity is the place where model attains the minimal error on unseen data.