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: The optimal value of alpha for ridge and lasso is 5.0 and 0.001 respectively. If I choose double the value of alpha for both which means 10.0 for ridge and 0.002 for lasso.

Metric	Optimal Ridge Alpha	Double Ridge Alpha	Optimal Lasso Alpha	Double Lasso Alpha
R2 Score (Train)	0.921011	0.912734	0.900304	0.877075
R2 Score (Test)	0.885092	0.881888	0.881941	0.859357
RSS (Train)	12.513036	13.824166	15.793288	19.473143
RSS (Test)	8.538225	8.776313	8.772354	10.450462
MSE (Train)	0.012256	0.013540	0.015468	0.019073
MSE (Test)	0.019494	0.020037	0.020028	0.023860
RMSE (Train)	0.110705	0.116361	0.124372	0.138104
RMSE (Test)	0.139620	0.141553	0.141521	0.154465

For Ridge model, R2 Score of train set decreased from 0.92 to 0.91 and for test set remain same at 0.88. And for Lasso model, R2 Score of train data set decreased from 0.90 to 0.87 and also for decreased for test data set from 0.88 to 0.85. the most important predictor variables after the change is implemented:

1. GrLivArea
2. GarageCars
3. OverallQual_9
4. TotRmsAbvGrd
5. OverallQual_8
6. YearRemodAdd
7. CentralAir_Y
8. BsmtExposure_Gd
9. Neighborhood_Crawfor
10. BsmtFullBath

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: Depending upon the number of variables, I will choose the model. If I will require using high numbers of predictor variables then i will go for Lasso because it will also help me to select features. And if I don't want to get too large coefficients and reduction of coefficient magnitude is one of my goals then I will use Ridge.

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?
Answer: The five most important predictor variables in the current lasso model are:

1. GrLivArea
2. GarageCars
3. OverallQual_9
4. TotRmsAbvGrd
5. FullBath

After creating another model excluding the five most important predictor variables, The five most important predictor variables will be:

1. RoofMatl_WdShngl
2. RoofMatl_CompShg
3. RoofMatl_WdShake
4. RoofMatl_Roll
5. RoofMatl_Tar&Grv

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?

Answer: To make model robust and generalisable, we have to ensure that our model is as simple as possible because simpler model can handle a new unfamiliar problem as compare to complex model. Complex model can solve familiar problem fast as compare simpler model because it memorized the data.

Extremely simple models are likely to fail in predicting complex real world phenomena. Simplicity has its own disadvantages.