Question 1 - Feature Observation

Answer：'RM' feature will make the 'MEDV' increase ,and 'LSTAT' feature does not necessarily make the 'MEDV' increase, and 'PTRATIO' maybe make the 'MEDV' increase

Question 2 - Goodness of Fit

Answer：This model has been successfully describes the change of the target variable, because the value of R is close to 1, the target variable can be perfect prediction

Question 3 - Training and Testing

Answer：We will be training set and testing set apart, can in order to better understand the model generalization to not seen data rather than fitting to have just seen the data

Question 4 - Learning the Data

Answer：Above, max\_depth is 1,3,6 and 10, with the increase of number of training curve scores began to decline, at the time of training depth reached 3, best of the model. If more training data, not necessarily can improve performance of the model.

Question 5 - Bias-Variance Tradeoff

Answer：When 1 training model to maximize the depth, the prediction is a very big variance, when to maximum depth of the model is trained, appeared a large deviation, the two lines with the increase of the depth of the training of a graphic gap away gradually, deviation is more and more big, if the model has enough data, but due to the complex enough to capture the basic relationship, will appear deviation (underfitting), high variance shows that model can predict the results generalize to extract the larger matrix of training samples. The training set is highly sensitive, also known as fitting (overfitting), usually, can use more data for training, in order to reduce the model to predict the results of variance and improve the precision.

Question 6 - Best-Guess Optimal Model

Answer：Maximum depth is a three layer model can best forecast has not seen the data, because the depth is 4 layers, minimum deviation, can very good fitting results, and the precision is also pretty high.

Question 7 - Grid Search

Answer：GridSearchCV according to the given model, automatically you cross validation, by adjusting each parameter to track scores as a result, in fact, instead of the process of parameter search for loop process.

Question 8 - Cross-Validation

Answer：Is a common test methods. The data set into 10 portions. Take turns to 9 as the training data, 1 minute as the test data, test. Each test will draw the corresponding correct (or error rate). Accuracy of the results of 10 times (or error rate) as the average estimate of the accuracy of algorithm, the general need of times and 10 fold cross-validation, on the average, to estimate the accuracy of the algorithm. Optimization model, using this method can improve the accuracy of grid search, higher reliability, reduce the deviation.

Question 9 - Optimal Model

Answer：Parameter 'max\_depth' is 4 for the optimal model.Guess the answers to questions 6 do the same

Question 10 - Predicting Selling Prices

Answer：suggest selling price for Client 1's home: $403,025.00, Client 2's home: $237,478.72,Client 3's home: $931,636.36 .Judging from the housing characteristics value, the price is reasonable

Question 11 - Applicability

Answer：Data collected in 1978, today is not applicable, because in the past time is too long, belongs to the outliers.

Data show features can be described in a house, if there are more features may better describe the house prices.

The model is robust enough to ensure consistency of prediction.

Data from the in metropolis such as Boston, cannot be applied in other rural areas, because the rest of the community poverty index and the nearby school student - teacher ratio and so on characteristics.