# Machine Learning Worksheet Solutions

1. Option a-> Least Square Error
2. Option a-> Linear Regression is Sensitive to outliers
3. Option b -> Considering that falls means going down on y-axis. In other words if falls means slanting down. If the meaning of FALLS is starting from left and ending on right, then option a, b and c all will be true.
4. Option b -> correlation
5. Option c -> Low Bias and High Variance
6. Option b -> Predictive Model
7. Option b -> regularization
8. Option a -> Cross validation
9. Option a -> TPR and FPR
10. Option a-> True
11. Option b-> Applying PCA to project high dimensional data
12. Option a,b -> We don't have to choose the learning rate. It becomes slow when number of features is very large. We need to iterate.
13. Regularization are techniques used to reduce the error by fitting a function appropriately on the given training set and avoid overfitting. There are two types of regularization techniqes.
    a. Ridge Regularization -> It modifies the overfitted or under fitted models by adding the penalty equivalent to the sum of the squares of the magnitude of coefficients. This means that the mathematical function representing our machine learning model is minimized and coefficeints are calculated.

b. Lasso Regularization -> It modifies the overfitted or underfitted models by adding the penalty equivalent to the sum of absolute value of coefficients. Lasso also performs coefficient minimization, but instead of squaring the magnitudes of coefficients, it takes the true value of coefficients.

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15. Error term present in the linear regression is the term which is not depnedent on the predictor variable. We approximate that there is a linear relationship between predictor variable and the prediction, and all the points which are away from the equation are because of the irrerucible error term. While fitting our model we ignore this error term as we assume that it is completley random. We assume that the error term is caused because of the things which are not in our control. If we denote our actual underlying equation as

$$Y = B0 + B1X + E$$

Where E is the error term,

Then the best guess for our model will be

$$y = B0 + B1x$$

we cannot actually predict the error term. We might find that our model is inaaccurate there might be a relation between the error term and Y variable which we do not know of.