Machine learning

1. A (least square error)
2. A (Linear regression is sensitive to outliers)
3. B (negative)
4. B (Correlation)
5. A (High bias and high variance)
6. B (Predictive modal)
7. D (Regularization)
8. A (Cross validation)
9. A (TPR and FPR)
10. A (True)
11. B (Apply PCA to project high dimensional data)
12. A (We don't have to choose the learning rate)
    B) It becomes slow when number of features is very large)
    C) We need to iterate.

13) When we use regression models to train some data, there is a good chance that the model will overfit the given training data set, Regularization helps sort this overfitting problem by restricting the degrees of freedom of a given equation i.e., simply reducing the number of degrees of a polynomial function by reducing their corresponding weights.

In a linear equation, we do not want huge weights/coefficients as a small change in a weight can make a large difference for the dependent variable(Y). so, regularization constraints the weight of such features to avoid overfitting.

14) The algorithms used in regularization are:

- LASSO (least absolute shrinkage and selection operator) regression (L1)
  LASSO regression penalizes the model based on the sum of magnitude of the coefficients. The term regularization is given by
  Regularization = $\lambda * \sum |\beta_j|$
  Where, λ is the shrinkage factor.
- Ridge Regression (L2 Form)
  Ridge regression penalizes the model based on the sum of squares of magnitude of the coefficients. The regularization term is given by
  Regularization = $\lambda * \sum |\beta_j^2|$
- Elasticnet
  It uses both Lasso as well as Ridge Regression regularization in order to remove all unnecessary coefficients but not the informative ones.

15) An error term represents the margin of error within a statistical model; it refers to the sum of the deviations within the regression line, which provides an explanation for the difference between the theoretical value of the model and the actual observed results. The regression line is used as a point of

analysis when attempting to determine the correlation between one independent variable and one dependent variable.