

# MACHINE LEARNING

## Answers:

1. A) Least Square Error
2. A) Linear regression is sensitive to outliers
3. B) Negative
4. B) Correlation
5. C) Low bias and high variance
6. D) All of the above
7. D) Regularization
8. D) SMOTE
9. A) TPR and FPR
10. B) False
11. B) Apply PCA to project high dimensional data
12. B) It becomes slow when number of features is very large.  
C) We need to iterate.
13. Regularization is a technique used in machine learning to prevent overfitting by adding a penalty term to the loss function that discourages the model from learning too much from the training data. Some regularization techniques are Lasso regularization, Ridge regularization and Elastic Net regularization.
14. The commonly used regularization algorithms are:
  - (a) Lasso Regularization – L1 Regularization

A regression model which uses the L1 Regularization technique is called LASSO (Least Absolute Shrinkage and Selection Operator) regression. Lasso Regression adds the “absolute value of magnitude” of the coefficient as a penalty term to the loss function (L). Lasso regression also helps us achieve feature selection by penalizing the weights to approximately equal to zero if that feature does not serve any purpose in the model.
  - (b) Ridge Regularization – L2 Regularization

A regression model that uses the L2 regularization technique is called Ridge regression. Ridge regression adds the “squared magnitude” of the coefficient as a penalty term to the loss function (L)

(c) Elastic Net Regularization – L1 and L2 Regularization

This model is a combination of L1 as well as L2 regularization. That implies that we add the absolute norm of the weights as well as the squared measure of the weights. With the help of an extra hyperparameter that controls the ratio of the L1 and L2 regularization.

15. The error term in a linear regression equation is a residual variable produced by a statistical or mathematical model. It is also known as the residual, disturbance or remainder term. It refers to the sum of the deviations within the regression line.

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