

## MACHINE LEARNING

**In Q1 to Q11, only one option is correct, choose the correct option:**

1. Which of the following methods do we use to find the best fit line for data in Linear Regression?  
☒ A) Least Square Error      B) Maximum Likelihood  
☐ C) Logarithmic Loss      D) Both A and B
2. Which of the following statement is true about outliers in linear regression?  
☒ A) Linear regression is sensitive to outliers      B) linear regression is not sensitive to outliers  
☐ C) Can't say      D) none of these
3. A line falls from left to right if a slope is \_\_\_\_\_?  
☐ A) Positive      ☒ B) Negative  
☐ C) Zero      D) Undefined
4. Which of the following will have symmetric relation between dependent variable and independent variable?  
☐ A) Regression      ☒ B) Correlation  
☐ C) Both of them      D) None of these
5. Which of the following is the reason for over fitting condition?  
☐ A) High bias and high variance      B) Low bias and low variance  
☒ C) Low bias and high variance      D) none of these
6. If output involves label then that model is called as:  
☐ A) Descriptive model      ☒ B) Predictive modal  
☐ C) Reinforcement learning      D) All of the above
7. Lasso and Ridge regression techniques belong to \_\_\_\_\_?  
☐ A) Cross validation      B) Removing outliers  
☒ C) SMOTE      D) Regularization
8. To overcome with imbalance dataset which technique can be used?  
☐ A) Cross validation      ☒ B) Regularization  
☐ C) Kernel      D) SMOTE
9. The AUC Receiver Operator Characteristic (AUCROC) curve is an evaluation metric for binary classification problems. It uses \_\_\_\_\_ to make graph?  
☒ A) TPR and FPR      B) Sensitivity and precision  
☐ C) Sensitivity and Specificity      D) Recall and precision
10. In AUC Receiver Operator Characteristic (AUCROC) curve for the better model area under the curve should be less.  
☐ A) True      ☒ B) False
11. Pick the feature extraction from below:  
☐ A) Construction bag of words from a email  
☐ B) Apply PCA to project high dimensional data  
☐ C) Removing stop words  
☐ D) Forward selection

**In Q12, more than one options are correct, choose all the correct options:**

12. Which of the following is true about Normal Equation used to compute the coefficient of the Linear Regression?  
☒ 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.  
☐ D) It does not make use of dependent variable.

## **MACHINE LEARNING**

**Q13 and Q15 are subjective answer type questions, Answer them briefly.**

13. Explain the term regularization?
14. Which particular algorithms are used for regularization?
15. Explain the term error present in linear regression equation?

Ans 13. Regularization is a technique which is used to improve the model prediction and reduce errors in order to minimize adjusted loss function and prevent underfitting and overfitting. It is also called shrinkage method. It basically adds penalty term to control the complex model to avoid overfitting by reducing the variance. With regularization techniques, we can fit our machine learning model appropriately on a given test set and hence reduce errors in it.

Different types of regularization techniques are:

1. Ridge Regression. (L2 regularization)
2. Lasso Regression. (L1 regularization)
3. Elastic Net Regression.

Ans 14. Algorithms present in regularization are:

1. Ridge Regression : in this equation we minimize sum of squared errors and sum of squared coefficients. Penalty factor ( $\lambda$ ) is applied to get smooth graph instead of irregular graph i.e. ridge regression adds "squared magnitude of coefficients" as penalty to the loss function.
2. Lasso Regression (Least absolute shrinkage and regression operator) : It is similar to ridge regression that in penalty factor, coefficient is magnitude instead of squared i.e. Lasso Regression adds 'absolute value of magnitude' of coefficients as penalty term to the loss function.
3. Elastic Net Regression.

Ans 15. An error term represents the margin of error within a statistical model or mathematical model, which is created when model does not fully represent the actual relationship between dependent and independent variable. As a result of this incomplete relationship, error term is the amount at which the equation may differ during analysis.

Error term is also known as residual, disturbance, or a remainder term.

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