

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)
- B) Maximum Likelihood C)
- C) Logarithmic Loss
- D) D) Both A and B

Ans: Least Square Error 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

Ans: Linear regression is sensitive to outliers

3. A line falls from left to right if a slope is _____?

- A) Positive
- B) Negative
- C) Zero
- D) Undefined

Ans: B) Negative

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

Ans: A) Regression

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

Ans: C) Low bias and high variance

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

Ans: B) Predictive modal

7. Lasso and Ridge regression techniques belong to _____?

- A) Cross validation
- B) Removing outliers
- C) SMOTE
- D) Regularization

Ans: D) Regularization

8. To overcome with imbalance dataset which technique can be used?

- A) Cross validation
- B) Regularization
- C) Kernel
- D) SMOTE

Ans: 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

Ans: A) TPR and FPR

10. In AUC Receiver Operator Characteristic (AUCROC) curve for the better model area under the curve should be less.

- A) True
- B) False

Ans: 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

Ans: B) Apply PCA to project high dimensional data

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

Ans: D) It does not make use of dependent variable.

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

13. Explain the term regularization?

Ans: Regularization is a technique used in machine learning to prevent overfitting and improve the performance of a model. Overfitting occurs when a model learns the training data too well and performs poorly on unseen data.

Regularization introduces a penalty term to the model's loss function, which helps to control the complexity of the model and reduce the impact of irrelevant features. The penalty term discourages large parameter values, effectively limiting the model's ability to fit the noise in the training data.

There are different types of regularization techniques, but the two most common ones are L1 regularization (Lasso regularization) and L2 regularization (Ridge regularization).

14. Which particular algorithms are used for regularization?

Ans: 1. LASSO (Least Absolute Shrinkage and Selection Operator): Lasso regression also adds a penalty term to the loss function, but it uses the sum of the absolute values of the weights. Lasso regression can perform feature selection by driving some of the weights to zero, effectively removing less important features.

2. Ridge regression : Ridge regression adds a penalty term to the loss function that is proportional to the sum of the squared weights. This encourages the model to have smaller weights, reducing the impact of irrelevant features.

3. Elastic-Net Regression: Elastic Net combines both L1 and L2 regularization. It adds a penalty term that is a linear combination of the L1 and L2 penalty terms. This allows for both feature selection and the ability to handle correlated features.

15. Explain the term error present in linear regression equation?

Ans: The term "error" refers to the difference between the predicted values and the actual values of the dependent variable. It represents the deviation or the "error" made by the model in estimating the target variable.

The goal of linear regression is to minimize the errors and find the best-fit line that represents the relationship between the independent variables and the dependent variable. The errors are typically measured as the vertical distance between the predicted values (points on the regression line) and the actual values (data points).