FLIP ROBO

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
   Answer:a]least square error

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
   Answer:a]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
   Answer: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
   Answer:b]Correlation

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
   Answer: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
   Answer:b]predictive modal

7. Lasso and Ridge regression techniques belong to_____?
   A) Cross validation
   B) Removing outliers
   C)SMOTE
   D) Regularization
   Answer:a]cross validation

8. To overcome with imbalance dataset which technique can be used?
   A) Cross validation
   B) Regularization
   C)Kernel
   D) SMOTE
   Answer: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
   Answer:c]sensitivity and specificity

10. In AUC Receiver Operator Characteristic (AUCROC) curve for the better model area under the curve should be less.
    A) True
    B) False
    Answer:true

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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
    Answer:a]construction bag of words from a email

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.

Answer:a] we don't have to choose the learning rate

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

13. Explain the term regularization?

Answer:Regularization is one of the most important concepts of machine learning. It is a technique to prevent the model from overfitting by adding extra information to it.

Sometimes the machine learning model performs well with the training data but does not perform well with the test data. It means the model is not able to predict the output when deals with unseen data by introducing noise in the output, and hence the model is called overfitted. This problem can be deal with the help of a regularization technique.

This technique can be used in such a way that it will allow to maintain all variables or features in the model by reducing the magnitude of the variables. Hence, it maintains accuracy as well as a generalization of the model.

It mainly regularizes or reduces the coefficient of features toward zero. In simple words, "In regularization technique, we reduce the magnitude of the features by keeping the same number of features."

14. Which particular algorithms are used for regularization?

Answer:There are different types of regularization algorithms, and each has its own advantages and disadvantages. The most common types of regularization algorithms are lasso, ridge, and elastic net.

Lasso Regularization: Lasso is a type of regularization that uses L1-norm Regularization. Lasso regularization works by adding a penalty to the absolute value of the magnitude of coefficients. This forces certain coefficients to be equal to zero, which in turn helps to reduce overfitting. It is useful for feature selection, as it can help to identify which features are most important for the model. The formula given below is a representation of Lasso regularization for linear regression model. The linear regression model with the below modified cost function is also termed Lasso regression.Lasso regularization linear regression model

Ridge Regularization: Ridge is a type of regularization that uses L2-norm Regularization. Ridge regularization works by adding a penalty to the square of the magnitude of coefficients. This forces all coefficients to be close to zero but does not allow them to be equal to zero. It is effective at reducing overfitting, and can also help to improve the interpretability of the model. The formula below represents the modified cost function of the linear regression model with L2 norm or L2 regularization. The linear regression model with a modified cost function is called the Ridge regression model.Ridge regularization linear regression model

Elastic net Regularization: Elastic net is a type of regularization that combines L1-norm Regularization and L2-norm Regularization. It is effective at both reducing overfitting and improving interpretability.

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

Answer:An error term essentially means that the model is not completely accurate and results in differing results during real-world applications. For example, assume there is a multiple linear regression function that takes the following form:

Y=αX+βρ+ε

where:

α,β=Constant parameters

X,ρ=Independent variables

ε=Error term

When the actual Y differs from the expected or predicted Y in the model during an empirical test, then the error term does not equal 0, which means there are other factors that influence Y.