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 is A

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 is A

3. A line falls from left to right if a slope is_____?
    A) Positive
    B) Negative
    C) Zero
    D) Undefined

    Answer is B

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 is A

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 is C

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 is B

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

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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

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.

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

13. Explain the term regularization?

Answer: Regularization refers to techniques that are used to calibrate machine learning models in order to minimize the adjusted loss function and prevent overfitting or underfitting. Using Regularization, we can fit our machine learning model appropriately on a given test set and hence reduce the errors in it.

14. Which particular algorithms are used for regularization?

Answer: Regularization Algorithms are given below:

Ridge regression – Its purpose is to overcome problems such as data overfitting and multicollinearity in data. When there is considerable among the feature variables, a typical linear or polynomial regression model will fail. Ridge Regression adjusts the variables by a modest squared bias factor. The feature variable coefficients are pulled away from this rigidity by such a squared bias factor, providing a little bit of bias into the model but considerably lowering variation.

Ridge is an excellent way to prevent overfitting. Use regularization to solve overfitting and feature selection if you have a model with a high number of features in the dataset and want to prevent making the model too complicated. However, the ridge has one major drawback: the final model has all characteristics. Ridge regression decreases the two coefficients towards each other when the variables are highly linked. Lasso is torn between the two and prefers one over the other.One never knows which variable will be chosen depending on the situation. Elastic-net is a hybrid of the two that tries to shrink while still doing the sparse selection.

LASSO – It simply penalizes large coefficients, in contrast to Ridge Regression. When the hyperparameter is big enough, Lasso has the effect of driving certain coefficient estimations to be absolutely zero. As a result, Lasso conducts variable selection, resulting in models that are significantly easier to read than Ridge Regression models. In a nutshell, it's about lowering variability and increasing the accuracy of linear regression models.If we have a large number of features, LASSO works effectively for feature selection.It reduces coefficients to zero and if a set of predictors is highly associated, lasso selects one and reduces the others to zero.

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