ASSIGNMENT – 39

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 in 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=(B)Low bias and low 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 model

7. Lasso and Ridge regression techniques belong to _____?
A) Cross validation B) Removing outliers
C) SMOTE D) Regularization

Answer=(B)Regularization

8. To overcome with imbalance data set 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=(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

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=1,2,and3

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

13. Explain the term regularization?

Answer=
In machine learning,The term regularization is a form of regression, that constrains/ regularizes or shrinks the coefficient estimates towards zero. In other words, this technique discourages learning a more complex or flexible model, so as to avoid the risk of over fitting.
Over fitting is a phenomenon that occurs when a Machine Learning model is constraint to training set and not able to perform well on unseen data.
Regularization is a technique used to reduce the errors by fitting the function appropriately on the given training set and avoid over fitting.

14. Which particular algorithms are used for regularization?

 Answer=
In machine learning,regularization have 3 algorithms
1.Ridge Regression(L2)
2.LASSO (Least Absolute Shrinkage and Selection Operator) Regression(L1)
3.Dropout regularization

1.Ridge Regression:
Ridge regression is a method for analyzing data that suffer from multi-collinearity.
Usage of Ridge Regression:
When we have the independent variables which are having high collinearity (problem of multicollinearity) between them, at that time general linear or polynomial regression will fail so to solve such problems, Ridge regression can be used.

If we have more parameters than the samples, then Ridge regression helps to solve the problems.

2.LASSO Regression:
LASSO is a regression analysis method that performs both feature selection and regularization in order to enhance the
 prediction accuracy of the model.

Loss Function for LASSO Regression
Lasso regression is another variant of the regularization technique used to reduce the complexity of the model. It stands for Least Absolute and Selection Operator.
LASSO regression adds a penalty (L1 penalty) to the loss function that is equivalent to the magnitude of the coefficients.
Limitation of Lasso Regression:
1)Problems with some types of Data set: If the number of predictors is greater than the number of data points, Lasso will pick at most n predictors as non-zero, even if all predictors are relevant.
2)Multi collinearity Problem: If there are two or more highly collinear variables then LASSO regression selects one of them randomly which is not good for the interpretation of our model.

3.   Dropout Regularisation:
Dropout is a regularization technique for reducing overfitting in neural networks by preventing complex co-adaptations on training data. It is a very efficient way of performing model averaging with neural networks. The term "dropout" refers to dropping out units (both hidden and visible) in a neural network.
A simple and powerful regularization technique for neural networks and deep learning models is dropout. This notebook will uncover the dropout regularization technique and how to apply it to deep learning models in Python with Keras.

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

Answer=
In machine learning,The term Error present in a linear regression model tracking a stock's price over time, the error term is the difference between the expected price at a particular time and the price that was actually observed. ... The error term stands for any influence being exerted on the price variable, such as changes in market sentiment.
Linear regression is a form of analysis that relates to current trends experienced by a particular security or index by providing a relationship between a dependent and independent variables, such as the price of a security and the passage of time, resulting in a trend line that can be used as a predictive model.
A linear regression exhibits less delay than that experienced with a moving average, as the line is fit to the data points instead of based on the averages within the data. This allows the line to change more quickly and dramatically than a line based on numerical averaging of the available data points.