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MACHINE LEARNING WORKSHEET 1

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
Ans- 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
Ans- 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
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- 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
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

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- A) We don't have to choose the learning rate.
B) It becomes slow when number of features is very large.

13. Explain the term regularization?
Ans- Regularization aids to deal with the overfitting issue that arises in regression models. It restricts the degree of freedom of a given equation, i.e., simply reducing the number of degrees of a polynomial function by reducing their corresponding weights. In order to regularize the model, a shrinkage penalty is added to the lost function

14. Which particular algorithms are used for regularization?
Ans- The algorithms used for regularization are as follows-

a) L1 Regularization or LASSO (Least Absolute Shrinkage and Selection Operator)- LASSO regression penalizes the model based on the sum of the magnitude of coefficients. In layman term, it omits out the predictors not having any influence on the feature. In LASSO, the L1 penalty reduces some coefficients exactly to zero when we use a sufficiently large tuning parameter λ . Si, in addition to regularizing, LASSO also performs feature selection. The regularization term is given by:

$$\text{Regularization} = \lambda * \Sigma|B_j|$$

where, λ is the shrinkage factor.

b) L2 Regularization or Ridge Regression- Ridge regression penalizes the model based on the sum of squares of magnitude of the coefficients.Ridge regression shrinks the coefficients for those predictors which contribute very less in the model but have huge weights. However, in the final model, these predictors are still present with reduced weights. The regularization term is given by:

$$\text{Regularization} = \lambda * \Sigma|B_j^2|$$

where, λ is the shrinkage factor.

15. Explain the term error present in linear regression equation?
Ans- An error term is a value which represents how observed data differs from actual population data. It is the term in a model regression equation that tallies up and accounts for the unexplained difference between the actually observed values of the independent variable and the results predicted by the model