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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
   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 outlier

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

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-C)Both of them

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-A)High 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-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
    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

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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.

Ans-A,B

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

13. Explain the term regularization?

Ans-Regularization is a set of methods for reducing overfitting in machine learning models. Typically,
regularization trades a marginal decrease in training accuracy for an increase in generalizability.

14. Which particular algorithms are used for regularization?

Ans-Ridge Regression

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

Ans- An error term essentially means that the model is not completely accurate and results
in differing results during real-world applications.

STATISTICS WORKSHEET-1

Q1 to Q9 have only one correct answer. Choose the correct option to answer your question.

1. Bernoulli random variables take (only) the values 1 and 0.
   a) True
   b) False

   Ans-a)True

2. Which of the following theorem states that the distribution of averages of iid variables, properly normalized, becomes that of a standard normal as the sample size increases?
   a) Central Limit Theorem
   b) Central Mean Theorem
   c) Centroid Limit Theorem
   d) All of the mentioned

   Ans-a) Central Limit Theorem

3. Which of the following is incorrect with respect to use of Poisson distribution?
   a) Modeling event/time data
   b) Modeling bounded count data
   c) Modeling contingency tables
   d) All of the mentioned

   Ans-d)All of the mentioned

4. Point out the correct statement.
   a) The exponent of a normally distributed random variables follows what is called the log- normal distribution
   b) Sums of normally distributed random variables are again normally distributed even if the variables are dependent
   c) The square of a standard normal random variable follows what is called chi-squared distribution
   d) All of the mentioned

   Ans-d)All of the mentioned

5. _____random variables are used to model rates.
   a) Empirical
   b) Binomial
   c) Poisson
   d) All of the mentioned

   Ans-c)

6. 10. Usually replacing the standard error by its estimated value does change the CLT.
   a) True
   b) False

   Ans-a)True

7. 1. Which of the following testing is concerned with making decisions using data?
   a) Probability
   b) Hypothesis
   c) Causal
   d) None of the mentioned

   Ans-b)Hypothesis

8. 4. Normalized data are centered at_____and have units equal to standard deviations of the original data.
   a) 0
   b) 5
   c) 1
   d) 10

   Ans-a)0

9. Which of the following statement is incorrect with respect to outliers?

a) Outliers can have varying degrees of influence
b) Outliers can be the result of spurious or real processes
c) Outliers cannot conform to the regression relationship
d) None of the mentioned

Ans-c) Outliers cannot conform to the regression relationship

Q10and Q15 are subjective answer type questions, Answer them in your own words briefly.

10. What do you understand by the term Normal Distribution?

Ans-Data are symmetrically distributed around mean ,median and mode or bell shaped distribution.

The form of normal distribution is determined by its mean and standard deviation.

Mean=0 and standard deviation =1.

11.How do you handle missing data? What imputation techniques do you recommend?

Ans-There are seven ways to handle the missing data.

(i)Deleting rows with missing values

(ii)Impute missing values for continous variable

(iii)Impute missing values for categorical variable

(iv)other imputation method

(v)Using algorithm that support missing values

(vi)Prediction of missing values

(vii)Imputation using deep learning method

I recommend deep learning method technique.

11. What is A/B testing?
Ans-A/B testing is a method that is used to compare two versions of a variable, such as a product or marketing campaign, to determine which one performs better

12. Is mean imputation of missing data acceptable practice?
Ans--yes

13. What is linear regression in statistics?
Ans-- Linear regression analysis is used to predict the value of a variable based on the value of another variable.The variable we want to predict is called the dependent variable.
The variable we are using to predict other variable's value is called the independent variable.

14. What are the various branches of statistics?
Ans-There are two main branches of statistics.
(i)Discriptive statistics
(ii)Inferential statistics
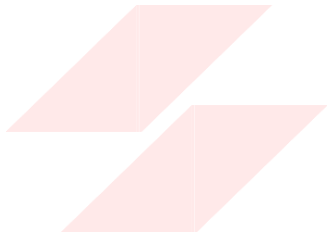
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PYTHON – WORKSHEET 1

Q1 to Q8 have only one correct answer. Choose the correct option to answer your question.

1. Which of the following operators is used to calculate remainder in a division?
   A) #   B) &
   C) %   D) $
   Ans-C)%

2. In python 2//3 is equal to?
   A) 0.666   B) 0
   C) 1   D) 0.67
   Ans-B)0

3. In python, 6<<2 is equal to?
   A) 36   B) 10
   C) 24   D) 45
   Ans-C)24

4. In python, 6&2 will give which of the following as output?
   A) 2   B) True
   C) False   D) 0
   Ans-A)2

5. In python, 6|2 will give which of the following as output?
   A) 2   B) 4
   C) 0   D) 6
   Ans-D)6

6. What does the finally keyword denotes in python?
   A) It is used to mark the end of the code
   B) It encloses the lines of code which will be executed if any error occurs while executing the lines of code in the try block.
   C) the finally block will be executed no matter if the try block raises an error or not.
   D) None of the above
   Ans-C) the finally block will be executed no matter if the try block raises an error or not.

7. What does raise keyword is used for in python?
   A) It is used to raise an exception.   B) It is used to define lambda function
   C) it's not a keyword in python.   D) None of the above
   Ans-A) A)   It is used to raise an exception.

8. Which of the following is a common use case of yield keyword in python?
   A) in defining an iterator   B) while defining a lambda function
   C) in defining a generator   D) in for loop.
   Ans-C) in defining a generator

Q9 and Q10 have multiple correct answers. Choose all the correct options to answer your question.

9. Which of the following are the valid variable names?
   A) _abc   B) 1abc
   C) abc2   D) None of the above
   Ans-C)abc2

10. Which of the following are the keywords in python?
    A) yield   B) raise
    C) look-in   D) all of the above
    Ans—D)all of the above

Q11 to Q15 are programming questions. Answer them in Jupyter Notebook.

11. Write a python program to find the factorial of a number.
12. Write a python program to find whether a number is prime or composite.
13. Write a python program to check whether a given string is palindrome or not.

14. Write a Python program to get the third side of right-angled triangle from two given sides.
15. Write a python program to print the frequency of each of the characters present in a given string.