

## STATISTICS ASSIGNMENT-1

1. Bernoulli random variables take (only) the values 1 and 0.

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

3. Which of the following is incorrect with respect to use of Poisson distribution?

b) Modeling bounded count data

4. Point out the correct statement.

d) All of the mentioned

5. \_\_\_\_\_ random variables are used to model rates.

c) Poisson

6. 10. Usually replacing the standard error by its estimated value does change the CLT.

b) False

7. Which of the following testing is concerned with making decisions using data?

b) Hypothesis

8. 4. Normalized data are centered at \_\_\_\_\_ and have units equal to standard deviations of the original data.

a) 0

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

c) Outliers cannot conform to the regression relationship

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

Ans. Normal distribution, also known as the Gaussian distribution, is a probability distribution that is symmetric about the mean, showing that data near the mean are more frequent in occurrence than data far from the mean. In graphical form, the normal distribution appears as a "bell curve".

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

Ans. Missing data can be dealt with in a variety of ways. I believe the most common reaction is to ignore it. Choosing to make no decision, on the other hand, indicates that your statistical programme will make the decision for you.

Your application will remove things in a listwise sequence most of the time. Depending on why and how much data is gone, listwise deletion may or may not be a good idea.

Another common strategy among those who pay attention is imputation. Imputation is the process of substituting an estimate for missing values and analysing the entire data set as if the imputed values were the true observed values.

The method we commonly used in this:-

Mean imputation

Calculate the mean of the observed values for that variable for all non-missing people. It has the advantage of maintaining the same mean and sample size, but it also has a slew of drawbacks. Almost all of the methods described below are superior to mean imputation.

12. What is A/B testing?

Ans. A/B testing (also known as split testing or bucket testing) is a methodology for comparing two versions of a webpage or app against each other to determine which one performs better. A/B testing is essentially an experiment where two or more variants of a page are shown to users at random, and statistical analysis is used to determine which variation performs better for a given conversion goal.

13. Is mean imputation of missing data acceptable practice?

Ans. Mean imputation is typically considered terrible practice since it ignores feature correlation. Consider the following scenario: we have a table with age and fitness scores, and an eight-year-old has a missing fitness score. If we average the fitness scores of people between the ages of 15 and 80, the eighty-year-old will appear to have a significantly greater fitness level than he actually does.

Second, mean imputation decreases the variance of our data while increasing bias. As a result of the reduced variance, the model is less accurate and the confidence interval is narrower.

14. 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 you want to predict is called the dependent variable. The variable you are using to predict the other variable's value is called the independent variable.

This form of analysis estimates the coefficients of the linear equation, involving one or more independent variables that best predict the value of the dependent variable. Linear regression fits a straight line or surface that minimizes the discrepancies between predicted and actual output values. There are simple linear regression calculators that use a "least squares" method to discover the best-fit line for a set of paired data. You then estimate the value of X (dependent variable) from Y (independent variable).

15. What are the various branches of statistics?

Ans. Statistics is a study of presentation, analysis, collection, interpretation and organization of data

There are **two main branches** of statistics

- Inferential Statistic.
- Descriptive Statistic.

### **Inferential Statistics:**

Inferential statistics used to make inference and describe about the population. These stats are more useful when its not easy or possible to examine each member of the population.

### **Descriptive Statistics:**

Descriptive statistics are use to get a brief summary of data. You can have the summary of data in numerical or graphycal form.

