

STATISTICS WORKSHEET-3

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

1. Which of the following is the correct formula for total variation?

- a) Total Variation = Residual Variation – Regression Variation
- b) Total Variation = Residual Variation + Regression Variation
- c) Total Variation = Residual Variation * Regression Variation
- d) All of the mentioned

Ans.) b

2. Collection of exchangeable binary outcomes for the same covariate data are called outcomes.

- a) random
- b) direct
- c) binomial
- d) none of the mentioned

Ans.) c

3. How many outcomes are possible with Bernoulli trial?

- a) 2
- b) 3
- c) 4
- d) None of the mentioned

Ans.) a

4. If H_0 is true and we reject it is called

- a) Type-I error
- b) Type-II error
- c) Standard error
- d) Sampling error

Ans.) a

5. Level of significance is also called:

- a) Power of the test
- b) Size of the test
- c) Level of confidence
- d) Confidence coefficient

Ans.) a

6. The chance of rejecting a true hypothesis decreases when sample size is:

- a) Decrease
- b) Increase
- c) Both of them
- d) None

Ans.) b

7. 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

8. What is the purpose of multiple testing in statistical inference?

- a) Minimize errors

- b) Minimize false positives
- c) Minimize false negatives
- d) All of the mentioned

Ans.) d

9. Normalized data are centred at__and have units equal to standard deviations of the original data

- a) 0



- b) 5
- c) 1
- d) 10

Ans.) a

Q10 and Q15 are subjective answer type questions, Answer them in your own words briefly.

10. What Is Bayes' Theorem?

Ans.) Bayes' Theorem states that the conditional probability of an event, based on the occurrence of another event, is equal to the likelihood of the second event given the first event multiplied by the probability of the first event.

11. What is z-score?

Ans.) Z-score can be defined as a numerical measurement describing the relationship between a value to the mean of a group of values. It helps understand how much a given value differs from the standard deviation. A 0 as z-score indicates that the data point's score is identical to the mean score.

The formula to calculate z-score is $z = (x - \mu) / \sigma$,

z = standard score

x = observed value

μ = mean of the sample

σ = standard deviation of the sample

12. What is t-test?

Ans.) A t-test, also referred to as t-distribution or t-statistic, is a statistical test that is used to compare the mean values between two groups or the difference between one group's mean and a standard value. It is often required in hypothesis testing to understand whether a process has an effective outcome or not on the population of interest or whether two groups are different from each other.

There are three types of t-tests, viz., one-sample t-test, two-sample t-test and paired t-test.

13. What is percentile?

Ans.) Percentile is best described as a value on the scale of 100 that depicts the percent of a distribution equal to or below it.

The formula to calculate percentile is $n = (P/100) \times N$,

P= percentile

N=number of values in a data set (Sorted from smallest to largest)

n= ordinal rank of a given value

14. What is ANOVA?

Ans.) ANOVA or Analysis of variance is a statistical technique used to check if the means of two or more groups are significantly different from each other.

15. How can ANOVA help?

Ans.) It helps to check the impact of one or more factors by comparing the means of different samples. In other words, with ANOVA test one can decide whether to reject the null hypothesis or accept alternate hypothesis.
