

STATISTIC WORKSHEET SET—3

ANSWERS

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) Total Variation = Residual Variation + Regression Variation

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) Binomial

3. How many outcomes are possible with Bernoulli trial?

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

ANS:- a) 2

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) Type-I error

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:- c) Level of confidence

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) Increase

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) Hypothesis

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) All of the mentioned.

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) 0

10. What Is Bayes' Theorem?

ANS:-

Bayes' Theorem is a mathematical formula used to determine or find the conditional probability of events. It describes the 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. This Theorem is used to classify any type of data.

Thomas Bayes, who discovered this formula in 1763, considered the foundation of the special statistical inference approach called the Bayes' inference. **The formula of Bayes Theorem is :-**

$$P(A|B) = P(B|A) \cdot P(A) / P(B)$$

Where:

- **$P(A|B)$** – the probability of event A occurring, given event B has occurred
- **$P(B|A)$** – the probability of event B occurring, given event A has occurred
- **$P(A)$** – the probability of event A
- **$P(B)$** – the probability of event B

11. What is z-score?

ANS:-

A **z-score** is a numerical measurement used in statistics, gives information about how far are the data point from the mean in terms of standard deviations .It is a statistical method through which we can find out the outliers.

- If a z-score is 0, indicates that the data point's score is identical to the mean score.
- If a z-score of 1, indicates a value that is one standard deviation from the mean score.

z-score can be positive or negative , with a positive value indicating the score is above the mean and a negative score indicating it is below the mean. Formula of z-score:-

$$\text{z-score} = \frac{x - \text{mean value}}{\text{standard deviation}}$$

12. What is t-test?

ANS:-

A **t-test** is a inferential statistical test which is widely used to compare the mean of two groups of samples. It is therefore used to evaluate whether the mean of the two sets of data are statically significantly different from each other.

The larger the t-score , the more difference there is between groups and the smaller the t-score , the more similarity there is between groups.

There are 2 types of t-test: -

- I. One sample t-test
- II. Two sample t-test

13. What is percentile?

ANS:-

In statistics, percentile is used to indicate the value below which the group of percentage of data falls. Percentile is different from percentage. It is used to get the idea of the frequency distribution of the data points.

The 50th percentile is the score below which 50% of score in the distribution may be found. 25th percentile(min) is known as 1st quartile, 50th percentile is mean and 75th percentile(max) is the 3rd quartile .

14. What is ANOVA?

ANS:-

An ANOVA test (**Analysis of variance**) is a type of statistical test used to determine if there is a statistically significant difference between two or more categorical groups by testing for differences of means using variance.

ANOVA uses variance based f test to check the group mean equality. There are different types of ANOVA tests. The two most common are a "One-Way" and a "Two-Way."

15. How can ANOVA help?

ANS:-

ANOVA helps to determine if difference in mean value between 3 or more groups are by chance or if they are indeed different. ANOVA make use of the f-test to determine the group mean are equal. ANOVA is helpful in testing 3 or more variables . It is used when one variable is numeric and one is categorical