

STATISTICS WORKSHEET-3

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**

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. **b) Size of the test**

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 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. *A z-score describes the position of a raw score in terms of its distance from the mean, when measured in standard deviation units. The z-score is positive if the value lies above the mean, and negative if it lies below the mean.*

It is also known as a standard score, because it allows comparison of scores on different kinds of variables by standardizing the distribution. A standard normal distribution (SND) is a normally shaped distribution with a mean of 0 and a standard deviation (SD) of 1

12. What is t-test?

Ans. *A t-test is a statistical test that is used to compare the means of two groups. It is often used in hypothesis testing to determine whether a process or treatment actually has an effect on the population of interest, or whether two groups are different from one another.*

13. What is percentile?

Ans. *A percentile is a measure used in statistics indicating the value below which a given percentage of observations in a group of observations fall. For example, the 20th percentile is the value (or score) below which 20% of the observations may be found.*

The term percentile and the related term percentile rank are often used in the reporting of scores from norm-referenced tests. For example, if a score is at the 86th percentile, where 86 is the percentile rank, it is equal to the value below which 86% of the observations may be found. In contrast, if it is in the 86th percentile, the score is at or below the value of which 86% of the observations may be found. Every score is in the 100th percentile.

The 25th percentile is also known as the first quartile (Q1), the 50th percentile as the median or second quartile (Q2), and the 75th percentile as the third quartile (Q3). In general, percentiles and quartiles are specific types of quantiles.

14. What is ANOVA?

Ans. *ANOVA stands for Analysis of Variance. An ANOVA test 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.*

Another Key part of ANOVA is that it splits the independent variable into 2 or more groups. For example, one or more groups might be expected to influence the dependent variable while the other group is used as a control group, and is not expected to influence the dependent variable.

15. How can ANOVA help?

Ans. *ANOVA is helpful for testing three or more variables. It is similar to multiple two-sample t-tests. However, it results in fewer type I errors and is appropriate for a range of issues. ANOVA groups differences by comparing the means of each group and includes spreading out the variance into diverse sources. It is employed with subjects, test groups, between groups and within groups.*

