

STATISTICS WORKSHEET-3

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

(Answers are marked in Red)

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

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

3. How many outcomes are possible with the Bernoulli trial?

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

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

5. Level of significance is also called:

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

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

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

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

- a) Probability
- b) Hypothesis**
- c) Causal
- d) None of the mentioned

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**

9. Normalized data are centered at and have units equal to standard deviations of the original data

- a) 0**
- b) 5
- c) 1
- d) 10

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

10. What Is Bayes' Theorem?

Ans. In probability, the Bayes theorem is a mathematical formula, which is used to determine the conditional probability of a given event. Conditional probability is defined as the likelihood that an event will occur, based on the occurrence of a previous outcome.

$P(A|B)$ is the probability of event A occurring given that B is true. $P(B|A)$ is the probability of event B occurring given that A is true. $P(A)$ and $P(B)$ are the probabilities of observing A and B respectively without any given conditions.

11. What is the z-score?

Ans. In statistics, Z-score is the method to find out the outliers present in the data, and also z-score shows how much the particular point is away from the standard deviation. Z-scores range from -3 standard deviations up to +3 standard deviations.

Formula for find out the z-score is : $z = (x - \mu) / \sigma$ where , x = data point μ = Mean value σ = Standard deviation

12. What is a t-test?

Ans. The independent sample t-test or 2 samples t-test compares the mean of two independent groups in order to determine whether the mean of two different variables is identical or not.

13. What is a percentile?

Ans. In statistics, the percentile is used to indicate the value below which the group the percentage of data fall. For example, the 20th percentile is the value (or score) below which 20% of the observations may be found.

14. What is ANOVA?

Ans. ANOVA test is a type of statical test that allows a comparison of more than two groups at the same time it helps to determine whether a relationship exists between them or not.

15. How can ANOVA help?

Ans. The one-way ANOVA can help you to determine whether or not there are significant differences between the means of your independent variables(for ex- Age, Sex, Position). When you understand how each independent variables are different from others, you can begin to understand which of them has a connection to your dependent variables and begin to learn what is driving that behavior.