FLIP ROBO

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

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 Bernoulli trial?
    a) 2
    b) 3
    c) 4
    d) None of the mentioned

4. If Ho 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 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 centred at____and have units equal to standard deviations of the original data
    a) 0
    b) 5
    c) 1
    d) 10

Q10and Q15 are subjective answer type questions, Answer them in your own words briefly.

10. What Is Bayes' Theorem?

Answer: Bayes' theorem is a fundamental result in probability theory that describes the relationship between an event and its prior probability and the likelihood of observing other evidence related to the event. It is a way of updating the probability for an event, based on new data. In other words, it is a method for calculating a conditional probability, the probability of an event occurring given that another event has occurred. Bayes' theorem is represented mathematically as $P(A|B) = P(B|A) * P(A) / P(B)$, where $P(A|B)$ is the conditional probability of event A given that event B has occurred, $P(B|A)$ is the likelihood of event B given that event A has occurred, $P(A)$ is the prior probability of event A, and $P(B)$ is the marginal probability of event B.

11. What is z-score?

Answer: It is defined as the number of standard deviations a given observation or data point is from the mean of the distribution.

12. What is t-test?

Answer: A t-test is a statistical test used to determine whether there is a significant difference between the means of two groups

13. What is percentile?

Answer: A percentile is a measure that describes the value below which a certain percent of observations in a data set fall.

14. What is ANOVA?

Answer: ANOVA stands for Analysis of Variance. It is a statistical method used to test the null hypothesis that the means of two or more groups are equal. ANOVA compares the means of different groups to determine whether there is a significant difference between them. It is used to determine whether there is a significant difference in the means of two or more groups of data, and it is a type of hypothesis testing.

15. How can ANOVA help?

Answer: ANOVA can help in several ways:
1.   Determining whether there is a significant difference between the means of two or more groups: ANOVA compares the means of different groups to determine whether there is a significant difference between them. This can help researchers or practitioners to identify which groups differ from each other and how they differ.
2.   Identifying which groups are responsible for the difference: ANOVA can help to identify which groups are responsible for the difference found in the means. This can help researchers or practitioners to pinpoint which groups or factors need to be studied further.
3.   Understanding the relationship between multiple variables: ANOVA can help to understand the relationship between multiple variables. For example, a two-way ANOVA can help to identify the interaction effect between two independent variables on the dependent variable.
4.   Identifying patterns in the data: ANOVA can help to identify patterns in the data. For example, a repeated measures ANOVA can help to identify whether there is a significant change in the mean of the dependent variable over time.
5.   Supporting decision making: ANOVA can help in decision making by providing a quantitative way to evaluate hypotheses about the differences between means. It can help to support or reject hypotheses, and

provide a basis for making decisions about future actions or research.