STATISTICS WORKSHEET-3

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

Solutions to the Objectives 1 to 12 are highlighted In GREEN

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?

Bayes Theorem: This involves the likelihood of an outcome occurring based on a previous outcome having occurred in similar circumstance. Its 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.

i.e $P(A|B)=P(B)P(A\cap B)=P(B)P(A)\cdot P(B|A)$

where:

$P(A)$= The probability of A occurring

$P(B)$= The probability of B occurring

$P(A|B)$=The probability of A given B

$P(B|A)$= The probability of B given A

$P(A\cap B)$)= The probability of both A and B occurring

11. What is z-score?

Z-Score: This indicates a numerical measurement that explains the a value's relationship to the mean of a group of values. It's how much a given value differs from the standard deviation
i.e Zscore=(x-mean)/std
where x = data
mean= average
std= Standard deviation

12. What is t-test?
t-test: it's a statistical test that compares the means of two samples. It measures the size of the difference relative to the variation in your sample data. It is used to determine if there is a significant difference between the means of two groups and how they are related.

13. What is percentile?

Percentile: It's a term that describes how a score compares to other scores from the same set. It's a comparison score between a particular score and the scores of the rest of a group.

14. What is ANOVA?

ANOVA Test(Analysis Of Variance)
ANOVA is used to compare differences of means **among more than 2 groups**. It does this by lookin g at variation in the data and where that variation is found (hence its name). Specifically, ANOVA co mpares the amount of variation between groups with the amount of variation within groups.

15. How can ANOVA help?

IMPORTANCE OF ANOVA
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.