STATISTICS WORKSHEET-3

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

Q1. 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

Q2. 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

Q3. How many outcomes are possible with Bernoulli trial?

a) 2

b) 3

c) 4

d) None of the mentioned

ANS:- a) 2

Q4. If Ho 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

Q5. 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

Q6. 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

Q8. 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

Q9. 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

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

Q10. What Is Bayes' Theorem?

ANS:- IT is a mathematical formula for determining conditional probability. Conditional probability is the likelihood of an outcome occurring ,based on a previous outcome occurring .

P(A|B)=[P(B|A)*P(A)]/P(B)

A,B = EVENT

P(A|B) =probability of A given B is true

P(B|A) = probability of B given A is true

P(A),P(B) = the independent probability of A and B

Q11. What is z-score?

ANS:- $z=(x-\mu)/\sigma$

Z = standard score

X = observed value

-μ = mean of sample

σ = standard deviation of the sample

A z- score is a numerical measurement that describe a value's relationship to the mean of a group of value .

z-score is measured in terms of standard deviation from the mean . If a z-score is 0 , it indicate that the data point's is identical to the mean score . A z-score of 1.0 would indicate a value that is one standard deviation from the mean . Z-score may be positive or negative , with positive value indicating the score is above the mean and a negative score indicating it is below the mean.

Q12. What is t-test?

ANS:- A t-test is a type of inferential statistic used to determine if there is a significant difference between the mean of two group , which may be related in certain feature. The t-test is one of many test used for the purpose of hypothesis testing in statistics.

t=(m-μ) / (s/sqrt(n))

t = student's t-test

m = mean

μ = theoretical value

s = standard deviation

{n} = variable set size

Q13. What is percentile?

ANS:- A percentile (or a centile) 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

Q14. What is ANOVA?

ANS:- Analysis of Variance (ANOVA) is an analysis tool used in statistics that splits an observed aggregate variability found inside a data set into two part

1)Systematic factors

2)random factors

The systematic factors have a statistical influence on the given data set ,while the random factors do not .

F=MST/MSE

F- ANOVA coefficient

MST-mean sum of squares due to treatment

MSE-mean sum of squares due to error

Q15. 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 1 errors and is appropriate for a range of issue.

ANOVA groups difference by comparing means of each group and include spreading out the variance into diverse source .