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

Answer: b) Total Variation = Residual Variation + Regression Variation.

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

Answer : c) binomial

3. How many outcomes are possible with Bernoulli trial?

a) 2

b) 3

c) 4

d) None of the mentioned

Answer: a) 2

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

Answer: 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

Answer: 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

Answer: 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

Answer: 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

Answer: 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

Answer: a) 0

10. What Is Bayes' Theorem?

Answer: Bayes’ theorem is a way to figure out conditional probability. Conditional probability is the probability of an event happening, given that it has some relationship to one or more other events. For example, your probability of getting a parking space is connected to the time of day you park, where you park, and what conventions are going on at any time. In a nutshell, Bayes’ theorem gives you the actual probability of an event given information about tests.

Bayes’ Theorem (also known as Bayes’ rule) is a deceptively simple formula used to calculate conditional probability. The Theorem was named after English mathematician Thomas Bayes (1701-1761). The formal definition for the rule is:

$$P(A|B) = \frac{P(B|A)P(A)}{P(B)}$$

11. What is z-score?

Answer: A z-score is a numerical measurement used in statistics of a value’s relationship to the mean (average) of a group of values, measured in terms of standard deviation from the mean.

If a z-score is 0, it indicates that the data points score is identical to the mean score. A z-score of 1 would indicate a value that is one standard deviation from the mean.

Z-scores may be positive or negative, with a positive value indicating the score is above the mean and a negative score indicating it is below the mean.

With the help of z-score we can find how much away is a point from the standard deviation.

$$\text{Z-score} = \frac{\text{Point-Mean}}{\text{Standard deviation}}$$

12. What is t-test?

Answer: 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.

A t-test can only be used when comparing the means of two groups.

The t-test is a parametric test of difference, meaning that it makes the same assumptions about your data as other parametric tests.

13. What is percentile?

Answer: Percentile is different from percentage. In statistics, percentile is used to indicate the value below which the group of percentage of data falls below.

For example : Consider if your score is 75^{th} percentile, which you scored far better than 75% of people who took part in the test.

It is most commonly applicable in indicating the scores from the norm-referenced exams such as GRE, SAT , LSAT.

14. What is ANOVA?

Answer: Analysis of Variance (ANOVA) is a statistical method used to test differences between two or more means. It may seem odd that the technique is called “Analysis of Variance” rather than “Analysis of Means”. As you will see the name is appropriate because inferences about means are made by analysing variance.

ANOVA is used to test general rather than specific differences among means.

Analysis of Variance is a method for testing differences among means by analysing variance. The test is based on two estimates of the population variance. One estimate is called the mean square error (MSE) and is based on the differences among scores within the groups. MSE estimates regardless of whether the null hypothesis is true. The second estimate is called the mean square between (MSB) and is based on differences among the sample means.

15. How can ANOVA help?

Answer: 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.