FLIP ROBO

STATISTICS WORKSHEET-8

Q1 to Q12 have only one correct answer. Choose the correct option to answer your question.

1. In hypothesis testing, type II error is represented by β and the power of the test is $1-\beta$ then β is:

a. The probability of rejecting H_0 when H_1 is true

b. The probability of failing to reject H_0 when H_1 is true

c. The probability of failing to reject H_1 when H_0 is true

d. The probability of rejecting H_0 when H_1 is true

   Ans:- (C)

2. In hypothesis testing, the hypothesis which is tentatively assumed to be true is called the

a. correct hypothesis

b. null hypothesis

c. alternative hypothesis

d. level of significance

   Ans:- (B)

3. When the null hypothesis has been true, but the sample information has resulted in the rejection of the null, a _____ has been made

a. level of significance

b. Type II error

c. critical value

d. Type I error

   Ans:- (D)

4.For finding the p-value when the population standard deviation is unknown, if it is reasonable to assume that the population is normal, we use

a. the z distribution

b. the t distribution with n - 1 degrees of freedom

c. the t distribution with n + 1 degrees of freedom

d. none of the above

   Ans:- (B)

5. A Type II error is the error of

a. accepting Ho when it is false

b. accepting Ho when it is true

c. rejecting Ho when it is false

d. rejecting Ho when it is true

   Ans:- (B)

6. A hypothesis test in which rejection of the null hypothesis occurs for values of the point estimator in either tail of the sampling distribution is called

a. the null hypothesis

b. the alternative hypothesis

c. a one-tailed test

d. a two-tailed test

   Ans:- (D)

7. In hypothesis testing, the level of significance is

a. the probability of committing a Type II error

b. the probability of committing a Type I error

c. the probability of either a Type I or Type II, depending on the hypothesis to be tested

d. none of the above

   Ans:- (B)

8. In hypothesis testing, b is

a. the probability of committing a Type II error

b. the probability of committing a Type I error

c. the probability of either a Type I or Type II, depending on the hypothesis to be test

d. none of the above

   Ans:- (A)

9. When testing the following hypotheses at an α level of significance

H_0: p = 0.7

H_1: p > 0.7

The null hypothesis will be rejected if the test statistic Z is

a. $z > z_{\alpha}$

b. $z < z_{\alpha}$

c. $z < -z$

d. none of the above

   Ans:- (A)

10. Which of the following does not need to be known in order to compute the P-value?

a. knowledge of whether the test is one-tailed or two-tail

b. the value of the test statistic

c. the level of significance

d. All of the above are needed

   Ans:- (C)

11. The maximum probability of a Type I error that the decision maker will tolerate is called the

a. level of significance

b. critical value

c. decision value

d. probability value

   Ans:- (A)

12. For t distribution, increasing the sample size, the effect will be on

a. Degrees of Freedom

b. The t-ratio

c. Standard Error of the Means

d. All of the Above

   Ans:- (A)

Q13 to Q15 are subjective answers type questions. Answers them in their own words briefly.

13. What is Anova in SPSS?

Ans:- ANOVA (Analysis of Variance) in SPSS is a statistical technique used to analyze the differences among means of two or more groups. ANOVA is a hypothesis-testing procedure that compares the means of two or more groups to determine whether they are significantly different from each other.

In SPSS, ANOVA can be conducted using the Analyze menu. To perform an ANOVA in SPSS, follow these steps:

1.   Select "Analyze" from the main menu.
2.   Click on "Compare Means" and then select "One-Way ANOVA."
3.   In the "One-Way ANOVA" dialog box, specify the variable that you want to test in the "Dependent List" box and the grouping variable in the "Factor" box.
4.   Click on the "Options" button to select the desired options, such as descriptive statistics, effect size measures, and post-hoc tests.
5.   Click "OK" to run the analysis.
        SPSS will generate an output table that summarizes the results of the ANOVA, including F-ratio, degrees of freedom, p-value, and effect size measures. The output table also includes post-hoc tests, such as Bonferroni or Tukey tests, which can be used to determine which groups are significantly different from each other.

14. What are the assumptions of Anova?

Ans:- ANOVA (Analysis of Variance) makes several assumptions about the data. Violation of these assumptions can lead to inaccurate results and conclusions. The assumptions of ANOVA are as follows:

1.Independence: The observations in each group are independent of each other. In other words, the value of one observation does not depend on the value of any other observation.

2.Normality: The data within each group are normally distributed. Normality can be checked using histograms, normal probability plots, or statistical tests, such as the Shapiro-Wilk test.

3.Homogeneity of variance: The variance of the data in each group is equal. Homogeneity of variance can be checked using statistical tests, such as Levene's test.

4.Random sampling: The data are obtained from a random sample from the population of interest.

5. Interval or ratio scale: The dependent variable is measured on an interval or ratio scale.

It is important to note that violation of these assumptions can affect the Type I error rate (the probability of rejecting a true null hypothesis) and the power of the ANOVA. Therefore, it is recommended to check these assumptions before performing ANOVA and consider using alternative tests if the assumptions are violated.

15. What is the difference between one way Anova and two way Anova?

Ans:- The main difference between one-way ANOVA and two-way ANOVA is the number of independent variables or factors being studied.

One-way ANOVA is used to compare the means of three or more groups based on a single independent variable or factor. For example, if we want to compare the mean test scores of students from three different schools (A, B, and C), one-way ANOVA can be used to determine whether there are significant differences among the means of the three groups.

Two-way ANOVA, on the other hand, is used to examine the effects of two independent variables or factors on a dependent variable. For example, if we want to determine whether there are

differences in the mean test scores of students from three different schools (A, B, and C) and also whether there are differences between male and female students, a two-way ANOVA can be used to examine the effects of two factors (school and gender) on test scores.

In summary, while one-way ANOVA compares the means of three or more groups based on a single independent variable or factor, two-way ANOVA examines the effects of two independent variables or factors on a dependent variable.