STATISTICS WORKSHEET

1. Rejection of the null hypothesis is a conclusive proof that the alternative hypothesis is

Answer→ a. True

2. Parametric test, unlike the non-parametric tests, make certain assumptions about

Answer→ a. The population size

3. The level of significance can be viewed as the amount of risk that an analyst will accept when making a decision

Answer→ a. True

4. By taking a level of significance of 5% it is the same as saying

Answer→ b. We are 95% confident that the results have not occurred by chance.

5. One or two tail test will determine

Answer→ c. If the region of rejection is located in one or two tails of the distribution.

6. Two types of errors associated with hypothesis testing are Type I and Type II. Type II error is committed when

Answer→ c. We accept a null hypothesis when it is not true.

7. A randomly selected sample of 1,000 college students was asked whether they had ever used the drug Ecstasy. Sixteen percent (16% or 0.16) of the 1,000 students surveyed said they had. Which one of the following statements about the number 0.16 is correct?

Answer→ a. It is a sample proportion.

8. In a random sample of 1000 students, $p\hat{}$ = 0.80 (or 80%) were in favour of longer hours at the school library. The standard error of $p\hat{}$ (the sample proportion) is

Answer→a. .013

9. For a random sample of 9 women, the average resting pulse rate is x = 76 beats per minute, and the sample standard deviation is s = 5. The standard error of the sample mean is

Answer→ c. 1.667

10. Assume the cholesterol levels in a certain population have mean μ= 200 and standard deviation σ = 24. The cholesterol levels for a random sample of n = 9 individuals are measured and the sample mean x is determined. What is the z-score for a sample mean x = 180?

Answer→ c. −0.83

11. In a past General Social Survey, a random sample of men and women answered the question “Are you a member of any sports clubs?” Based on the sample data, 95% confidence intervals for the population proportion who would answer “yes” are .13 to .19 for women and .247 to .33 for men. Based on these results, you can reasonably conclude that

Answer→ c. There is a difference between the proportions of American men and American women who belong to sports clubs.

12. Suppose a 95% confidence interval for the proportion of Americans who exercise regularly is 0.29 to 0.37. Which one of the following statements is FALSE?

Answer→ b. It is reasonable to say that more than 40% of Americans exercise regularly.

13. How do you find the test statistic for two samples?

Answer→

The test statistic for a two-sample independent t-test is calculated by taking the difference in the two sample means and dividing by either the pooled or unpoled estimated standard error. The estimated standard error is an aggregate measure of the amount of variation in both groups.

14. How do you find the sample mean difference?

Answer→

Measures the absolute difference between the mean value in two different groups. In clinical trials, it gives you an idea of how much difference there is between the averages of the experimental group and control groups.

Although a lot of authors use the term mean difference, it makes more intuitive sense to say difference between means. That's because you aren't calculating any means; You'll already have two or more means, and all you need to do is find a difference between them. In other words, you're finding a difference between means and not a mean of differences.

15. What is a two sample t test example?

Answer→

A two sample t-test is used to determine whether or not two population means are equal.

Suppose we want to know whether the mean weight between two different species of turtles is equal. To test this, will perform a two-sample t-test at significance level α = 0.05 using the following steps:

Step 1: Gather the sample data.

Suppose we collect a random sample of turtles from each population with the following information:

- Sample 1:

• Sample size n1 = 40

• Sample mean weight x1 = 300

• Sample standard deviation s1 = 18.5

- Sample 2:

• Sample size n2 = 38

• Sample mean weight x2 = 305

• Sample standard deviation s2 = 16.7

Step 2: Define the hypotheses.

- We will perform the two sample t-test with the following hypotheses:

• H0: μ1 = μ2 (the two population means are equal)

• H1: μ1 ≠ μ2 (the two population means are not equal)

Step 3: Calculate the test statistic t.

- First, we will calculate the pooled standard deviation sp:

sp = √ (n1-1)s12 + (n2-1)s22/ (n1+n2-2) = √ (40-1)18.52 + (38-1)16.72/ (40+38-2) =17.647

Next, we will calculate the test statistic t:

t = (x1 – x2) / sp(√1/n1 + 1/n2) = (300-305) / 17.647(√1/40 + 1/38) = -1.2508

Step 4: Calculate the p-value of the test statistic t.

- According to the T Score to P Value Calculator, the p-value associated with t = -1.2508 and degrees of freedom= n1+n2-2 = 40+38-2 = 76 is 0.21484.

Step 5: Draw a conclusion.

- Since this p-value is not less than our significance level α = 0.05, we fail to reject the null hypothesis. We do not have sufficient evidence to say that the mean weight of turtles between these two populations is different.