Worksheet No. 2 Statistics
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1. The owner of a travel agency would like to determine whether or not the mean age of the agency's customers is over 24. If so, he plans to alter the destination of their special cruises and tours. If he concludes the mean age is over 24 when it is not, he makes a _____ error. If he concludes the mean age is not over 24 when it is, he makes a _____error.
c. Type I; Type II

2. Suppose we wish to test H0: $\mu = 53$ vs H1: $\mu > 53$. What will result if we conclude that the mean is greater than 53 when its true value is really 55?
b. We have made a correct decision

3. The value that separates a rejection region from an acceptance region is called a _____.
b. critical value

4. A hypothesis test is used to prevent a machine from under filling or overfilling quart bottles of beer. On the basis of sample, the machine is shut down for inspection. A thorough examination reveals there is nothing wrong with the filling machine. From a statistical point of view:
b. A Type I error was made.

5. Suppose we wish to test H0 : $\mu = 21$ vs H1 : $\mu > 21$. Which of the following possible sample results gives the most evidence to support H1 (i.e., reject H0)? Hint: Compute Z-score.
c. x = 17 s , = 7

6. Given H0: $\mu = 25$, H1: $\mu \neq 25$, and P-value = 0.041. Do you reject or fail to reject H0 at the 0.01 level of significance?
a. fail to reject H0

7. A bottling company needs to produce bottles that will hold 12 ounces of liquid. Periodically, the company gets complaints that their bottles are not holding enough liquid. To test this claim, the bottling company randomly samples 36 bottles. Suppose the p-value of this test turned out to be 0.0455. State the proper conclusion.
c. At $\alpha = 0.05$, reject the null hypothesis.

8. If a hypothesis test were conducted using $\alpha = 0.05$, for which of the following p-values would the null hypothesis be rejected?
b. 0.041

9. For H1: $\mu > \mu 0$ p-value is 0.042. What will be the p-value for Ha: $\mu < \mu o$?
c. 0.958

10. The test statistic is t = 2.63 and the p-value is 0.9849. What type of test is this?
c. Left tail

11. The test statistic is z =2.75, the critical value is z = 2.326. The p- value is …
a. Less than the significance level
b. Equal to the significance level
c. Large than the significance level

12. The area to the left of the test statistic is 0.375. What is the probability value if this is a left tail test?
b. 0.375

13.What is T distribution and Z distribution?
Ans:
T distribution is a distribution where the most datapoints falls near to mean and the rest are lying away from the mean making a tail on either of sides (left or right)
Z distribution is symmetrical about mean, there are equal no. of datapoints on either of side of mean considered as 0 and standard deviation is 1, it is also known as normal distribution or bell-shaped curve.

14.Is the T distribution normal?
Ans:
T distribution is a type of normal distribution use for small sample size less than 30.

15.What does the T distribution tell us?
Ans:
When the population standard deviation is unknown, and sample is coming from a normally distributed population then the T distribution is used to describe the distance between the population mean and sample mean