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ME2C

WEEK 8
MATH EDA

PROGRESS CHECK ANSWER:

1. What is hypothesis testing?

Hypothesis testing is a form of inferential statistics that allows us to draw conclusions about an entire population based on a representative sample. In other words, it is a formal procedure for investigating our ideas about the world using statistics and often used by the researchers.

2. Why is it called null hypothesis?

The word "null" in this context means that it's a commonly accepted fact that the researchers work to invalidate. It doesn't mean that the statement is null itself or amounts to nothing. But in meaningful words, it's a typical theory which suggests that no statistical relationship and significance exist in a set of given data.

3. What is sample error?

Sample error is the difference between the sample statistic and the population value. For example, the difference between a population mean and sample mean. It occur because the sample is not representative of the population or biased in some way.

4. What are the types of errors in hypothesis testing? Give "new" examples.

- Type 1 error (false positive)
  Ex. The test result says you have coronavirus or COVID19, but you actually don't.

- Type 2 error (false negative)
  Ex. The test results says you don't have coronavirus or COVID19, but you actually do.

5. What is a z-test?

Z-test is any statistical test for which the distribution of the test statistic under the null hypothesis can be approximated by a normal distribution. In other words, these are statistical calculations that can be used to compare population means to a sample's.

6. What is a t-test?

T-tests are statistical hypothesis that you use to analyze one or two sample means. Specifically, it is a type of inferential statistic used to determine if there is a significant difference between the means of two groups.

7. What is the next step test to use if the two sample sets have the same variances?

Equal Variance t-test is used when the number of sample in each group is the same or the variance of the two data sets is similar.

(8.) What is a degrees of freedom?

Degrees of freedom refers to the values in a study that has the freedom to vary and are essential for assesing the importance and the validity of the null hypothesis. In other words, these are numbers of dimensions of the domain of random vector or essentially the number of "free" components.

(9.) What is a p-value?

p-values are probability that you would obtain the effect observed in your sample, or larger, if the null hypothesis is correct. It is a measure of the probability than an observed difference could have occured just by random chance. Thus, the lower the p-value, the greater the statistical significance of the observed difference.

(10.) What is a one tailed test and a two-tailed test? How do they differ?

One tailed test is a statistical test in which the critical area of a distribution is one-sided so that it is either greater than or less than a certain value, but not both. while the two-tailed test is a method in which the critical area of a distribution is two-sided and tests whether a sample is greater or less than a range of values. the difference between them is that one-tailed test is used to ascertain if there is any relationship between variables in a single direction, either left or right. As against this, the two-tailed test is used to identify whether or not there is any relationship between variables in either direction.