Q1. What is Hypothesis Testing (Nuel and Alternate)?

Hypothesis

A ~~Statical~~ statistical hypothesis is an assumption about a population parameter. This assumption may or may not be true.

For instance the statement that a population mean is equal to 10 is an example of a statistical hypothesis. A researcher might conduct a statistical experiment to test the validity of this hypothesis.

Hypothesis Testing

Statician follows a formal process to determine whether to reject a null hypothesis based on sample data. This process called Hypothesis Testing.

Or

Hypothesis Testing refers to the formal procedures used by statistician to accept or reject null Hypothesis.

There are 2 types of Hypothetical Tests:-

- Nuel Hypothesis:- The null hypothesis, denoted by H_0 is usually the hypothesis that sample observations result purely from chance.

- Alternative Hypothesis:-

The alternative Hypothesis, denoted by H_1 or H_a, is the hypothesis that sample observations are influenced by some random cause.

for example:-

Suppose we wanted to determine whether a coin was fair and balanced. A null hypothesis might be that half the flips would result in Heads and half in Tails. The alternative Hypothesis might be number of Heads or Tails would be very different.

Symbolically

H_0 P = 0.5

H_a: P ≠ 0.5

Suppose we flipped the coin 50 times, resulting in 90 Heads and 10 tails. We would be inclined to reject the null Hypothesis. We would conclude, based on evidence, this coin was probably not fair and balanced.

Hypothesis Testing consists of four steps:-

- State The Hypothesis:- involves stating the null and alternative Hypothesis. The hypothesis are stated in such a way that they are mutually exclusive. That is, if one is true, the other must be false.

- Formualate an Analysis Plan:- The analysis plan describes how to use sample data to evaluate the null hypothesis. The evaluation often focused around a single test statistic.

- Analyze Sample data:- find the value of the test statistic (mean score, proportion, t- statistic, z-score, etc) described in the analysis plan.

- Interpret Results:- Apply the Decision Rule described in the analysis plan. If the value of the test statistic is unlikely, based on the null hypothesis, reject the null hypothesis.

Q2. What is Population and ~~Variance~~? Sample?

Population and Variance

Population :

A population is the entire group that you want to draw conclusions about.

In statistics, population is the entire set of items from which you draw data for a statistical study. It can be a group of ~~statistics~~ individuals, a set of items etc. It makes up the data pool for a study.

Sample :-

A sample is the specific group that you will collect data from. The size of sample is always less than the total size of the population.

In research, a population doesn't always refer to a people. It can mean a groups ~~contain~~ containing elements of anything you want to study, such as objects, events, organization countries, species, organisms etc.

Population	Sample
→ Advertisements for IT Jobs in the Netherlands	→ The top 50 search results for advertisements for IT Jobs in the Netherlands on may 1, 2020.
→ Songs from the Eurovision song contest.	winning songs from the Eurovision song contest that were performed in English.

Q3. What is Type 1 and Type 2 error?

Ans- Type-1 Error:- A Type-1 error occurs when the researcher rejects a null hypothesis when it is true. The probability of committing a Type-I error is called the significance level.

Type-2 Error:- A type-II error occurs when the researcher fails to reject a null Hypothesis ~~when it is true,~~ that is false. The probability of committing a type-II error is called Beta, and is often denoted by B. The probability of not commiting a type-II error is called the power of the test.