Name

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Course

Date

Hypothesis Testing and Decision-Making

Statistics is crucial in the information age, as it allows for decisions to be inferred based on the information available. Hypothesis testing is particularly significant because it prompts the making of inferences about populations based on information retrieved from a random sample (Wilcox 2). Statistical hypothesis testing has played a significant role in the building of knowledge across different disciplines, since it exploits data to test the feasibility of a particular hypothesis. By definition, a hypothesis is a statement concerning a set of parameters of a population distribution whose truth has not been established (Ross 291). While hypothesis testing does not necessarily establish the truth of a claim, it determines whether the data is consistent with the claim. Generally, if the random sample aligns with the claim, the hypothesis is said to be accepted; otherwise, it is rejected.

Generally, a hypothesis is rejected or accepted based on a significance level, commonly referred to as p values. It assumes that a population has a distribution of F_{θ}, where θ is unknown, and a specific hypothesis about θ is to be tested. Hypothesis H_0 is referred to as a null hypothesis. There are two possible null hypotheses about θ for an F_{θ}, which is a normal distribution function with a mean of and variance of 1, including:

a) $H_o: \theta = 1$

b) $H_o: \theta \leq 1$

The first null hypothesis completely specifies the population distribution when true and hence is referred to as a simple hypothesis, while the second one does not and is referred to as a composite hypothesis. Testing a specific null hypothesis demands the observation of a population and is defined by a critical region, C, in an n-dimensional space, assuming that the null hypothesis is rejected if it falls within the critical region. The critical region can be defined as:

$$C = \left\{ \left(X_1, \ldots, X_n\right) \left| \frac{\sum_{i=n}^{n} X_i}{n} - 1 \right| > \frac{1.96}{\sqrt{n}} \right\}$$

In conclusion, hypothesis testing aligns statistical claims with the existing random data, making it one of the most important inferential tools in the information age.

Work Cited

Ross, Sheldon M. *Introduction to probability and statistics for engineers and scientists*. Academic Press, 2020.

Wilcox, Rand R. "Hypothesis Testing in Business Administration." *Oxford Research Encyclopedia of Business and Management*. 2020.