University of Information Technology & Sciences

Department of
Computer Science and Engineering

Lab Assignment 02

Course Title: Simulation & Modeling Lab
Course Code: CSE-413

Submitted To

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Part C :

① Suppose $\alpha = 0.05$

a) If $p = 0.03 \rightarrow H_1$ wins because $p(0.03) \leq \alpha(0.05)$.
The evidence is strong enough to reject H_0.

b) If $p = 0.08 \rightarrow H_0$ wins because $p(0.08) > \alpha(0.05)$
The evidence is not strong, so we fail to reject H_0.

②

i) We need α because it works as a decision cut off. without α. we can not say clearly whether the evidence is strong enough to reject H_0.

ii) If p-value is small. It means the data gives very strong evidence against H_0. So we are more confident to accept H_1.

③ Example: with $\alpha = 0.01$

Case 1: $p = 0.008 \rightarrow$ Since $p \leq \alpha$, we H_0 and accept H_1. (Evidence is strong)

Case 2: $p = 0.02 \rightarrow$ since $p > \alpha$, we fail to reject H_0. (Evidence is not strong enough)

Part D: Courtroom Analogy:

Hypothesis testing is like a courtroom trial. Here H_0 means the person is innocent, and H_1 means the person is guilty. The p-value is the evidence presented by the lawyer. The p-value ~~is~~ judges sets α as the level of strictness for the proof. If the evidence is strong enough and falls below the judges standard (α), we reject innocence (H_0) and declare the person guilty (H_1). If the evidence is weak ($p > \alpha$). The judge cannot reject innocence. so the person stays innocent (failed to reject H_0)