EXPERIMENT 13

Hypothetical Using T-Test

Aim:

To test whether the average IQ score of a sample of students differs significantly from a population mean IQ score of 100.

Algorithm:

1. Import the required libraries — numpy and scipy.stats.

2. Set a random seed for reproducibility.

3. Generate or input the sample data and specify the population mean.

4. Calculate the sample mean and standard deviation.

5. Perform a one-sample T-test using stats.ttest\_1samp().

6. Get the T-statistic and p-value from the test result.

7. Set the significance level (α), usually 0.05.

8. Compare the p-value with α and conclude whether to reject or accept the null hypothesis.

Program:

import numpy as np

import scipy.stats as stats

np.random.seed(42)

sample\_size = 25

sample\_data = np.random.normal(loc=102, scale=15, size=sample\_size)

population\_mean = 100

sample\_mean = np.mean(sample\_data)

sample\_std = np.std(sample\_data, ddof=1)

t\_statistic, p\_value = stats.ttest\_1samp(sample\_data, population\_mean)

print(f"Sample Mean: {sample\_mean:.2f}")

print(f"T-Statistic: {t\_statistic:.4f}")

print(f"P-Value: {p\_value:.4f}")

alpha = 0.05

if p\_value < alpha:

print("Reject the null hypothesis: The average IQ differs from 100.")

else:

print("Fail to reject the null hypothesis: No significant difference from 100.")

Output:

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AI-generated content may be incorrect.

Result:

Hence a python program for hypothetical using T-test is written and executed successfully.