**8. T-TEST**

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CODE:

import numpy as np

import scipy.stats as stats

# Set a random seed for reproducibility

np.random.seed(42)

# Generate hypothetical sample data (IQ scores)

sample\_size = 25

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

size=sample\_size) # Mean IQ of 102, SD of 15

# Population mean under the null hypothesis

population\_mean = 100

# Calculate sample statistics

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

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

n = len(sample\_data)

# Calculate the T-statistic and p-value

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

population\_mean)

# Print results

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

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

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

# Decision based on the significance level

alpha = 0.05

if p\_value < alpha:

print("Reject the null hypothesis: The average IQ score is

significantly different from 100.")

else:

print("Fail to reject the null hypothesis: There is no

significant difference in average IQ score from 100.")

OUTPUT:

