**Assignment 7**

**Roll no. : A-44**

**Subject : DAP**

**Code:**

from scipy import stats

import numpy as np

sample1 = [84, 82, 85, 88, 90, 89, 86, 87, 88, 85]

sample2 = [79, 80, 77, 81, 83, 82, 80, 81, 82, 78]

def z\_test(sample1, sample2):

mean1 = np.mean(sample1)

mean2 = np.mean(sample2)

std1 = np.std(sample1, ddof=1)

std2 = np.std(sample2, ddof=1)

z\_score = (mean1 - mean2) / np.sqrt((std1\*\*2)/len(sample1) + (std2\*\*2)/len(sample2))

p\_value = 2 \* (1 - stats.norm.cdf(abs(z\_score)))

return z\_score, p\_value

def t\_test(sample1, sample2):

t\_statistic, p\_value = stats.ttest\_ind(sample1, sample2, equal\_var=False)

return t\_statistic, p\_value

def main():

z\_score, p\_value = z\_test(sample1, sample2)

print("Results of z-test:")

print("Z-score:", z\_score)

print("P-value:", p\_value)

if p\_value < 0.05:

print("Null hypothesis rejected: There is a significant difference between the means.")

else:

print("Null hypothesis not rejected: There is no significant difference between the means.")

print("\n")

t\_statistic, p\_value = t\_test(sample1, sample2)

print("Results of t-test:")

print("T-statistic:", t\_statistic)

print("P-value:", p\_value)

if p\_value < 0.05:

print("Null hypothesis rejected: There is a significant difference between the means.")

else:

print("Null hypothesis not rejected: There is no significant difference between the means.")

if \_\_name\_\_ == "\_\_main\_\_":

main()

**Output:**

Results of z-test:

Z-score: 6.22218666840013

P-value: 4.902731554068396e-10

Null hypothesis rejected: There is a significant difference between the means.

Results of t-test:

T-statistic: 6.222186668400129

P-value: 9.592495091498574e-06

Null hypothesis rejected: There is a significant difference between the means.