**1)** **You are involved in a pharmaceutical study examining the effects of a new drug on blood pressure. Below are the blood pressure measurements before and after administering the drug. Your research question is: Does the drug have a significant impact on blood pressure, and is there a consistent change across individuals?**

# Blood pressure measurements before administering the drug (in mmHg)

before\_drug = [120, 118, 122, 124, 115]

# Blood pressure measurements after administering the drug (in mmHg)

after\_drug = [110, 112, 108, 115, 113]

1. Write Python code to calculate the mean and standard deviation of blood pressure measurements before and after administering the drug.
2. Write Python code to assess the change in means to see if there's a noticeable change in blood pressure after drug administration.

mean\_change = mean\_before - mean\_after

1. Write Python code to examine the variability in individual responses by comparing the standard deviations.

std\_dev\_change = std\_dev\_before - std\_dev\_after

**2)** **You are conducting a pharmaceutical study to evaluate the effectiveness of a new treatment. Below are the patient response scores before and after treatment. Your research question is: Does the treatment lead to a significant improvement in patient response scores, and is there evidence of consistency in the treatment effect across patients?**

# Patient response scores before treatment

before\_treatment = [65, 70, 62, 68, 75]

# Patient response scores after treatment

afer\_treatment = [78, 82, 75, 80, 85]

1. Write Python code to calculate the mean and standard deviation of patient response scores before and after treatment
2. Write Python code to assess the change in mean scores to determine the impact of the treatment.
3. Write Python code to examine the variability in individual responses by comparing the standard deviations.