EXPERINMENT-19

19. Scenario:

You are a medical researcher investigating the effectiveness of a new drug in reducing blood pressure. You conduct a clinical trial with a sample of 50 patients who were randomly assigned to receive either the new drug or a placebo. After measuring their blood pressure levels at the end of the trial, you obtain the data for both groups. Now, you want to determine the confidence intervals for the mean reduction in blood pressure for both the drug and placebo groups.

Question:

"What is the 95% confidence interval for the mean reduction in blood pressure for patients who received the new drug? Also, what is the 95% confidence interval for the mean reduction in blood pressure for patients who received the placebo?

Code:

```
import numpy as np
from math import sqrt
from statistics import mean
drug = np.array([12,15,18,20,22,25,17,19,23,21])
placebo = np.array([5,7,6,8,9,10,7,6,5,8])
def confidence_interval_95(data):
    n = len(data)
    mean_val = mean(data)
    std_dev = np.std(data, ddof=1)
    se = std_dev / sqrt(n)
    t_value = 2.262
    lower = mean_val - t_value * se
    upper = mean_val + t_value * se
    return lower, upperdrh
drug_ci = confidence_interval_95(drug)
placebo_ci = confidence_interval_95(placebo)
print("95% Confidence Interval for Drug Group:")
print(drug_ci)
print("\n95% Confidence Interval for Placebo Group:")
print(placebo_ci)
```

Output:

```
[Running] python -u "c:\Users\karan\OneDrive\Desktop\New folder (2)\19.py"
95% Confidence Interval for DRUG group:
(np.float64(16.223477541960087), np.float64(21.776522458039913))

95% Confidence Interval for PLACEBO group:
(np.float64(5.810208068610313), np.float64(8.189791931389687))

[Done] exited with code=0 in 0.26 seconds
```