import pandas as pd

import numpy as np

from scipy import stats

import matplotlib.pyplot as plt

np.random.seed(42)

control = np.random.normal(loc=50, scale=10, size=30)

treatment = np.random.normal(loc=60, scale=10, size=30)

df = pd.DataFrame({

    'Group': ['Control']\*30 + ['Treatment']\*30,

    'Outcome': np.concatenate([control, treatment])

})

t\_stat, p\_value = stats.ttest\_ind(treatment, control)

print(f"T-statistic: {t\_stat:.3f}")

print(f"P-value: {p\_value:.3f}")

plt.figure(figsize=(8,6))

plt.boxplot([control, treatment], labels=['Control', 'Treatment'])

plt.title('Clinical Trial Outcome by Group')

plt.ylabel('Outcome Measure')

plt.figtext(0.15, 0.85, f'p-value = {p\_value:.3f}', fontsize=12, color='red')

plt.show()

if p\_value < 0.05:

    print("Result: Statistically significant difference between groups (p < 0.05).")

else:

    print("Result: No statistically significant difference (p >= 0.05).")

OUTPUT:

T-statistic: 4.513

P-value: 0.000

c:\Users\dadak\.vscode\EXP 28.py:16: MatplotlibDeprecationWarning: The 'labels' parameter of boxplot() has been renamed 'tick\_labels' since Matplotlib 3.9; support for the old name will be dropped in 3.11.

plt.boxplot([control, treatment], labels=['Control', 'Treatment'])

Result: Statistically significant difference between groups (p < 0.05).

