TASK:

Consider a real-world scenario where you need to conduct a statistical test for paired data, multiple population means, or variance comparisons. Describe the problem, the data, and the research question. Discuss the appropriate statistical test that you would use to address the research question and explain why. Perform the test. Propose a Python tool to assist with the interpretation of the results of the statistical test and visualizations. How can you use the results to inform decisions or actions in the real-world scenario?

- Problem description:

Suppose we are studying the effect of Obama Care on health insurance coverage. We wish to determine whether there is a significant difference between the percentage of uninsured before and the percentage of uninsured after Obama Care went into effect.

- Data :

The Affordable Care Act (ACA) is the name for the comprehensive health care reform law and its amendments which addresses health insurance coverage, health care costs, and preventive care. The law was enacted in two parts: The Patient Protection and Affordable Care Act was signed into law on March 23, 2010 by President Barack Obama and was amended by the Health Care and Education Reconciliation Act on March 30, 2010.

- Appropriate statistical test:

To answer this question, a paired t-test should be performed. This test compares the percentage of uninsured in 2010 and 2015 to determine whether there is a statistically significant difference between the two.

- Python tool:

To perform the paired t-test and interpret the results, we can use the Python library scipy.stats. In addition, we can use matplotlib for visualizations, such as boxplots or histograms, to compare the distribution.

dataset: https://www.kaggle.com/datasets/hhs/health-insurance/data

References:

Jim, F. Paired T Test: Definition & When to Use It. Statistics by
    Jim. https://statisticsbyjim.com/hypothesis-testing/paired-t-test/

statistics solutions. Directory of Statistical Analyses. https://www.statisticssolutions.com/free-
    resources/directory-of-statistical-analyses/