Project: Test a Perpetual Phenomenon

Q1. What is our independent variable? What is our dependent variable?

- Independent Variable - Correct ink colour to word name.
- Dependent Variable - Reaction Time.

Q2. What is an appropriate set of hypotheses for this task? What kind of statistical test do you expect to perform? Justify your choices.

- H_0 - No significant difference between time taken to answer both the conditions.
  $\mu_{congruent} = \mu_{incongruent}$ ($\alpha = 0.5$)

- H_A - Significant difference between reaction time for both the conditions.
  $\mu_{congruent} \neq \mu_{incongruent}$ ($\alpha = 0.5$)

A valid of hypothesis is one that validates the existence of the stroop effect. Here we try to find whether, if the difference is significant enough to be considered. We are provided with a sample, which we can use it to infer the results.

- Test - Two tailed dependent sample T-tests.

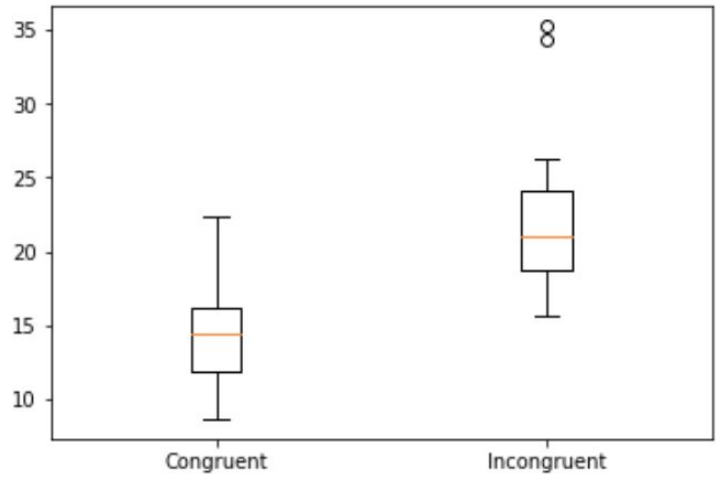
Because we are comparing reaction time of a sample, from a sample population, in two different conditions and then concluding the results of population.

Q3. Report some descriptive statistics regarding this dataset. Include at least one measure of central tendency and at least one measure of variability.

Congruency	**Mean** (Time)	**Median** (Time)	**Standard Deviation** (Time)
Congruent	14.05	14.35	3.55
Incongruent	22.01	21.01	4.79

Above calculations can be verified from the included Calculations.html file.

Q4. Provide one or two visualizations that show the distribution of the sample data. Write one or two sentences noting what you observe about the plot or plots.



From the above Boxplot we can observe a significant difference between the Median value of Congruent set and Incongruent set.

Q5. Now, perform the statistical test and report your results. What is your confidence level and your critical statistic value? Do you reject the null hypothesis or fail to reject it? Come to a conclusion in terms of the experiment task. Did the results match up with your expectations?

t (23) = - 8.02 , p = 0.00 , two-tailed
t - critical = 2.06
C.I on mean difference: 95% CI = (-13.48, -2.45)

Above calculations can be verified from the included Calculations.html file.

Since, p value < 0.025 for two-tailed test, we reject the Null Hypothesis H_0
Therefore there is significant difference in the reaction time in both the conditions.

Possible Cause of Effect:

In case of congruent test, the mapping of word to the colour (wavelength of light) is clearly visible and directly mentioned.

In case of incongruent test the mapping of word to colour (wavelength of light) is not mentioned, moreover, it has false colours written as word names.

This leads to increase in time to identify the colour based on the wavelength of light, unlike the congruent set where words written had true identity of the colours