TEST A PERCEPTUAL PHENOMENON (Stroop Effect)
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1. **What is our independent variable? What is our dependent variable?**
   The response time to complete test is dependent variable.
   Words conditions such as color of ink and word name is an independent variable.

2. **What is an appropriate set of hypotheses for this task? What kind of statistical test do you expect to perform? Justify your choices.**
   Null Hypothesis ($\mathbf{H_0}$):
   There is no difference in population means of response time under incongruent and congruent conditions
   H0: $\mu C = \mu I$

   Alternate Hypothesis **(Ha) :**
   Population mean of the response time under incongruent condition will be significantly larger than the response time under congruent condition
   Ha : $\mu C < \mu I$

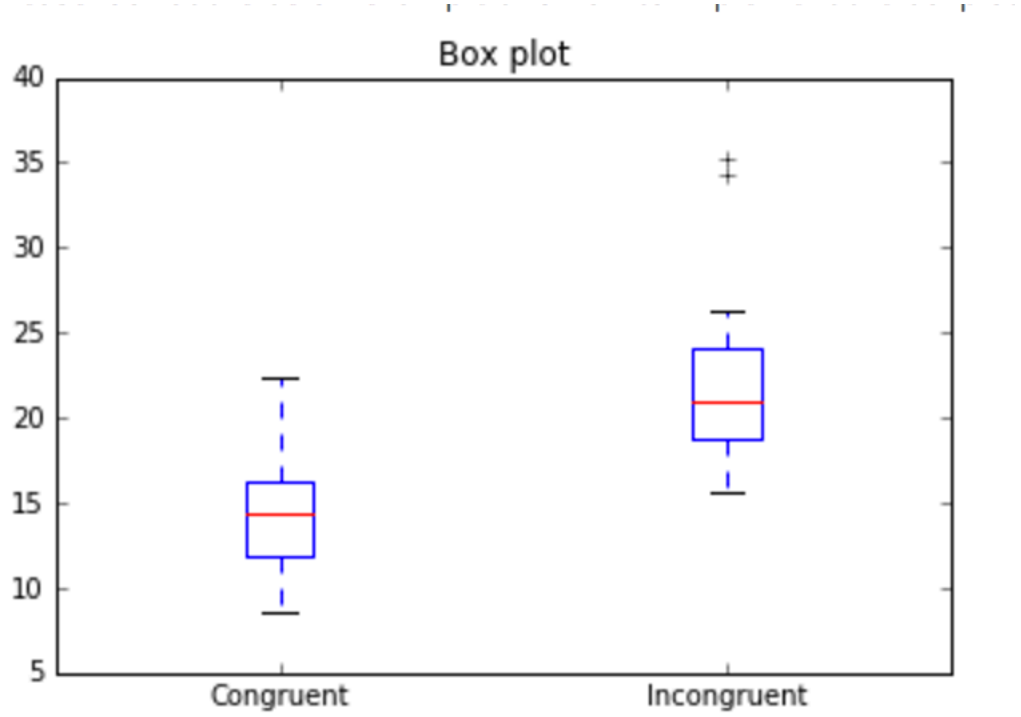
   The statistical test I expect to perform is a dependent sample two-tailed-t-test. Because all the participants were doing experiments with both condition. After that, the two-tailed would be higher where the null hypothesis would be rejected.

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

   Measures of central tendency
   Congruent Condition sample mean : 14.05
   Congruent Condition sample mean : 14.36
   Incongurent condition sample mean : 22.02
   Incongruent condition sample mean : 21.02

   Measures of variability
   Congruent cond. Variance : 12.669
   Congruent cond. Standard dev. : 3.559
   Differences(D) standard dev : 4.865
   Incongruent cond. Variance : 23.012
   Incongruent cond. Standard dev : 4.797
   Standard error : 0.993

4. **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.**



There is significant increase of duration to finish the test. 75% data incongruent is above the congruent.

5. **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?**

   I reject the null hypothesis. As I expected the incongruence has significant difference with congruence. Why I reject the Null?
   1. Because the p-value is lower than alpha.
   P value < Aplha
   0.0001 < 00.5

   2. Because t-statstics > critical statistic value
      8.021 > 2.069

   3. The respectives values are outside the confidence interval which mean 5.937 and 9.993

   Alpha : 0.05
   T statistic : 8.021
   T critical value : 2.069
   Point estimate : 7.965
   Confidence intervals : 5.937 and 9.993
   P value less than 0.0001

6. **Optional: What do you think is responsible for the effects observed? Can you think of an alternative or similar task that would result in a similar effect?**

Some research about the problem will be helpful for thinking about these two questions!

I think the effect caused by our brain when we read a words.
The alternative or similar task is make a background colour different.

Reference :
https://www.rit.edu/cla/gssp400/sbackground.html
http://support.minitab.com/en-us/minitab/17/topic-library/basic-statistics-and-graphs/hypothesis-tests/basics/null-and-alternative-hypotheses/