Project Overview

In this project, you will investigate a classic phenomenon from experimental psychology called the **Stroop Effect**. You will learn a little bit about the experiment, create a hypothesis regarding the outcome of the task, then go through the task yourself. You will then look at some data collected from others who have performed the same task and will compute some statistics describing the results. Finally, you will interpret your results in terms of your hypotheses.

Find the spreadsheet with the calculations here:

https://docs.google.com/spreadsheets/d/1Qd7yl5De-Ery-8FLOgPfK_Tli-2HEVTq1P7k_3nV9io/edit#gid=0

Question 1.) What is our Independent variable? What is our dependent variable?

Ans. Independent - the words condition I.e.congruent and incongruent .
Dependent - the time it takes to name the ink colors in equally-sized lists.

Question 2. What is an appropriate set of hypotheses for this task?What kind of statistical test do you expect to perform? Justify your choices.

Ans. Null hypothesis (H0): The mean time for the population to name the ink colors for the Congruent is equal to mean time taken for Incongruent conditions (μc = μI);

Alternative Hypothesis (Ha): The mean time for the population to name the ink colors is different for the Congruent and Incongruent conditions (μC != μI);

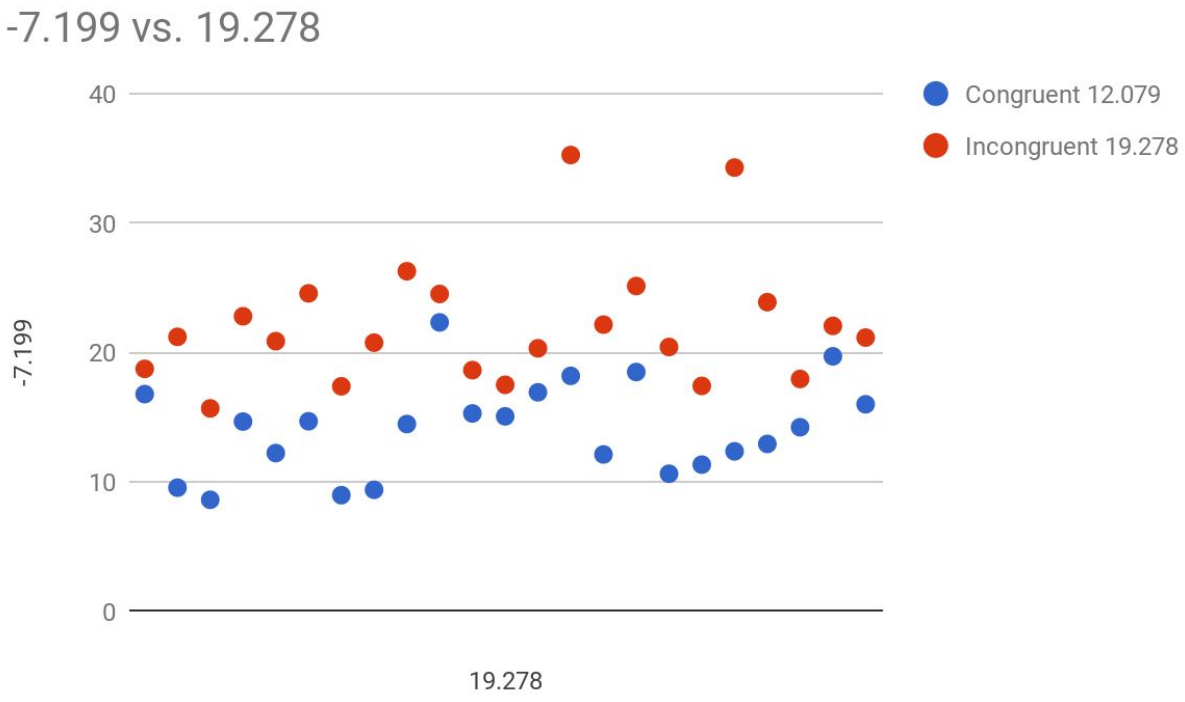
We expect to perform a paired t-test as we are assume the distributions are normal The two samples are dependent also we do not know the population's standard deviation.

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

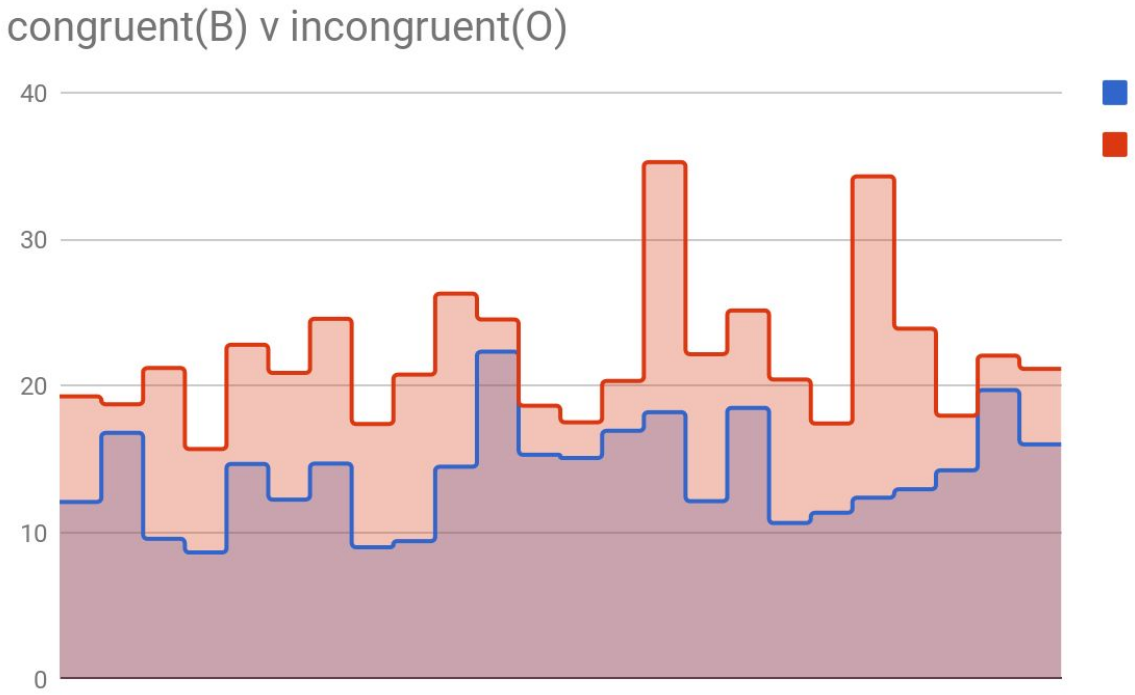
Ans. mean is -7.964791667 , standard devitation is 4.8648 , SEM is 0.9930,r^2 is 0.7366 etc, click my google sheet link to see my work.

Question 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?

Ans.



Show there are some corelation between two samples.



Times on the incongruent that is plotted in orange is more than time in congruent plotted in blue.

Question 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?

Ans. Confidence level is 99% and Alpha is .01

t-critical which is two-tailed = (+-)2.807

t-statistic = -8.02

r^2 = .737

Here, Our t-statistic is less than the - t-critical (-8.021 < -2.807) so null hypothesis is rejected.

This result means that the difference between the congruent and incongruent samples is statistically significant. The results match my expectations.

Question 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!

Ans Understanding and reading the word is a result of habitual reading, and recognizing colors is not, the brain needs more attention on it, interfering with the color recognition. A similar experiment could be to show pentagon and hexagon randomly above or below a central point (incongruent), and compare it to showing up pentagon above and hexagon below a central point (congruent).

REFERENCES:

https://en.wikipedia.org/wiki/Stroop_effe