UDACITY PROJECT #2

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

Independent variable: The colors of the words

Dependent variable: Time taken to name the ink colors.

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: - The time taken by the participants to name the ink colors do not change from congruent words to incongruent words

$\mu_C - \mu_I = 0$

Alternate hypothesis: -The time taken by the participants to read the ink colors of congruent words is lesser than that of the incongruent words.

$\mu_C - \mu_I < 0$

μ_C-Mean time taken for participants to read congruent words

μ_I-Mean time taken for participants to read incongruent words

Kind of statistical test: -Pre-Test, Post Test

This is a Pre Test Post Test because the same set of participants are first subjected to perform a task under initial conditions(congruent words) and later perform the same task with a treated set of words(incongruent words).

-Dependent-Samples t-test (One tailed)

This is a one tailed t-test as we look for significance in a specific direction.

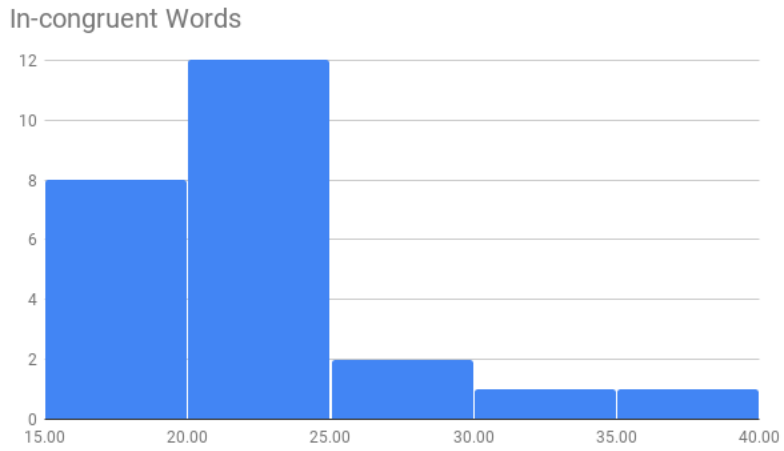
3. Report some descriptive statistics regarding this dataset. Include at least one measure of central tendency and at least one measure of variability.

Pre Test(congruent words)	Post Test(Incongruent Words)	Differnece
12.079	19.728	-7.199
16.791	18.741	-1.95

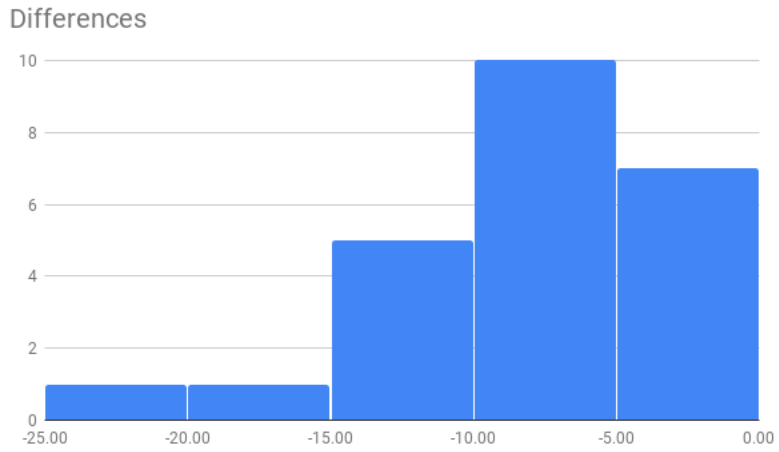
9.564	21.214	-11.65
8.63	15.687	-7.057
14.669	22.803	-8.134
12.238	20.878	-8.64
14.692	24.572	-9.88
8.987	17.394	-8.407
9.401	20.762	-11.361
14.48	26.282	-11.802
22.328	24.524	-2.196
15.298	18.644	-3.346
15.073	17.51	-2.437
16.929	20.33	-3.401
18.2	35.255	-17.055
12.13	22.158	-10.028
18.495	25.139	-6.644
10.639	20.429	-9.79
11.344	17.425	-6.081
12.369	34.288	-21.919
12.944	23.894	-10.95
14.233	17.96	-3.727
19.71	22.058	-2.348
16.004	21.157	-5.153
Mean=14.05	**Mean=22.01**	**Mean=-7.96**
Std.Dev=3.55	**Std.Dev=4.79**	**Std.Dev=4.86**

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.

-This is a normal distribution. This can be interpreted as the presence of a standard difference between the observations made and the average.



-Positively skewed distribution



-Negatively skewed distribution

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?

Confidence level=0.05
t-critical value= -1.714
SEM=0.99

t-statistic= -8.020
p-value
p<0.00001
The Result is significant at p<0.05

Conclusion:
WE REJECT THE NULL.
The reaction time of the participants is lesser when the ink colors are congruent.

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!

Reasons for the Stroop effect

-There are several theories that aim at explaining the Stroop Effect. **In my opinion**, the brain is confused when given a word that is expressed in terms of something that it does not signify and thus needs some time to map the information received correctly.

-**The Speed of Processing Theory**: The interference occurs cause words are read faster than colors are named.

-**Selective Attention Theory**: The interference occurs cause naming colors require more attention than reading words.

References: https://faculty.washington.edu/chudler/words.html