STROOP TEST

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

Independent variable : We can choose between congruent words or incongruent words for the subject to read.

Dependent variable : Response time and errors made by the subject while reading words cannot be controlled and it is our dependent 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.

Directional hypothesis is appropriate for stroop effect.Directional hypothesis express the effect of independent variable on dependent variables. Stroop effect states that independent variable incongruent words will increase the reaction time of the subject.
We can form a

Null hypothesis stating that : ‘’Independent variable: incongruent word will have no effect on the response time of the subject”
Alternate hypothesis stating that: ‘’Independent variable: incongruent word will increase the response time of the subject”.

Paired sample T-test will be an appropriate statistic to verify this effect.
With t-test,we can compare results of two independent test outcomes more reliably for given degree of freedom.
By comparing t-value with confidence level we can test the hypothesis of stroop effect experiment.

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

Statistics
No of records : 24

Congruent :
Mean = 14.05
Mode = No Mode
Median = 14.3565

Q1 = 11.89
Q3 = 16.20
IQR = 4.30

Standard Deviation(sample) : 3.559

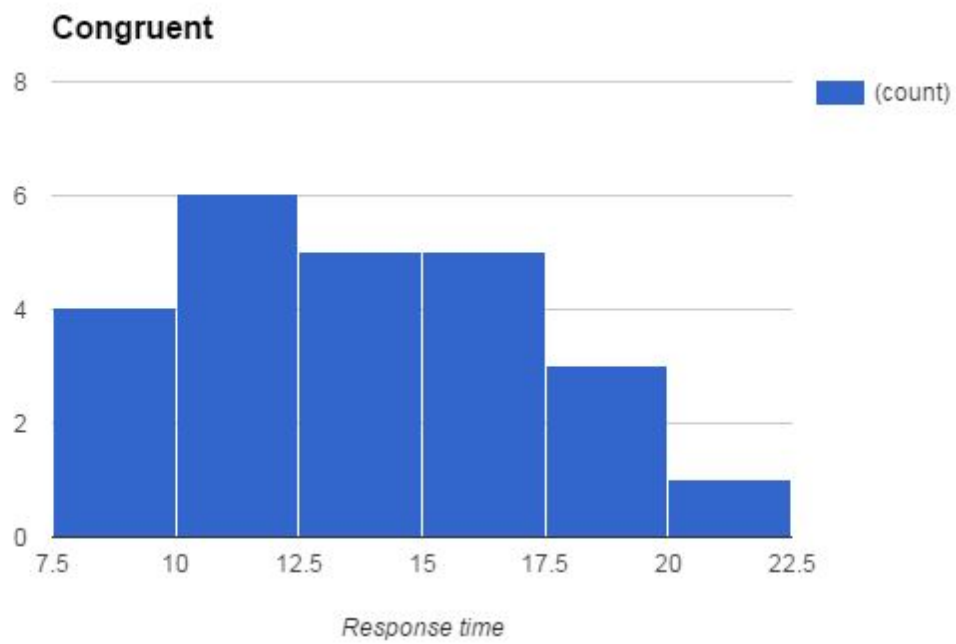
Incongruent :
Mean : 22.015
Mode : No Mode
Median : 22.015

Q1 = 18.71
Q3 = 24.05
IQR = 5.33
Standard Deviation(sample) : 4.797

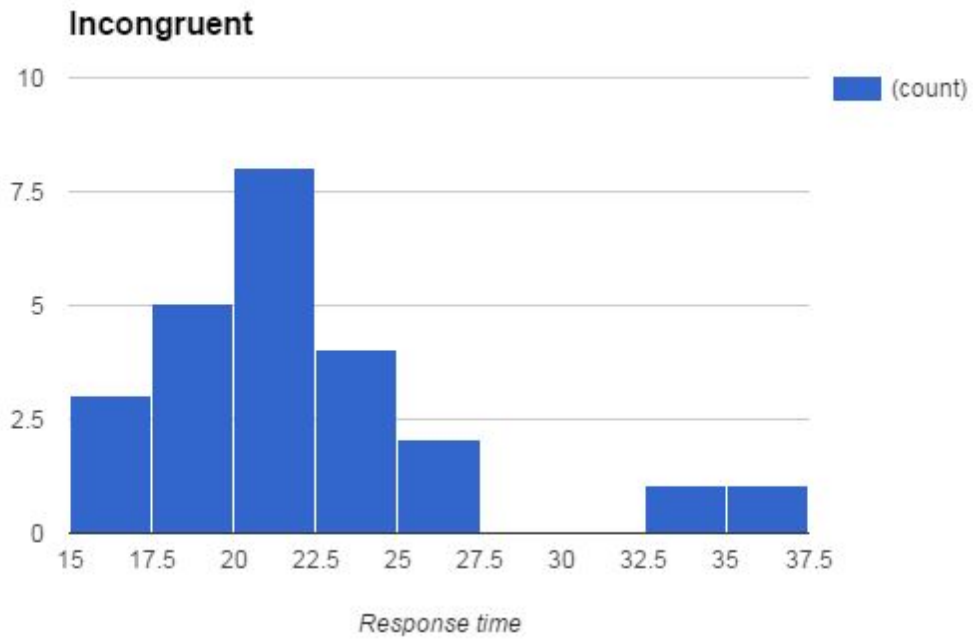
Difference : [' Difference between incongruent and congruent']
Mean : 7.96
Mode : No Mode
Median : 4.762

Q1 = 3.64
Q3 = 10.25
IQR = 6.61
Standard Deviation(sample) : 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.



Histogram plot of Congruent time graph. X-axis represents Response time take to read the congruent words. Range of the x-axis is 7.5 to 22.5. Bin size is 2.5. Bin 10-12.5 has the highest mode of 6. Distribution forms a right skewed normal distribution.



Histogram plot of incongruent time graph. X-axis represents Response time take to read the congruent words. Range of the x-axis is 15 to 37.5. Bin size is 2.5. Bin 20-22.5 has the highest mode of 6. Distribution forms a right skewed normal distribution.(given little more records).

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?

Null Hypothesis : H_0 : mean $_{diff}$ = 0
Alternate Hypothesis : H_1: mean $_{diff}$ > 0 (one-tail)

Confidence level = 0.001

Diff mean = 7.96
Diff Std = 4.86

N = 24

T = diff mean - 0 / (diff std / sqrt(n))

T-value = 8.0238
P-value < 0.0001

confidence-level(0.001) is greater that p-value.Null hypothesis is rejected. So, Two sample are significantly different. Even during my personal stroop effect there is significant difference between congruent and incongruent tests. Results are in accordance to my expectations.