STROOP DATA

	A	B
1	Congruent	Incongruent
2	12.079	19.278
3	16.791	18.741
4	9.564	21.214
5	8.63	15.687
6	14.669	22.803
7	12.238	20.878
8	14.692	24.572
9	8.987	17.394
10	9.401	20.762
11	14.48	26.282
12	22.328	24.524
13	15.298	18.644
14	15.073	17.51
15	16.929	20.33
16	18.2	35.255
17	12.13	22.158
18	18.495	25.139
19	10.639	20.429
20	11.344	17.425
21	12.369	34.288
22	12.944	23.894
23	14.233	17.96
24	19.71	22.058
25	16.004	21.157

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

INDEPENDENT VARIABLE - Word Condition.

DEPENDENT VARIABLE - Response Time in seconds.

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 (Ho): (μi = μc) There is **no** significant difference in the population average response time of the congruent words vs viewing the incongruent words.
Alternative Hypothesis (Ha): (μi ≠ μc) There is a significant difference in the population average response times.
(μi – population average response time of congruent words
μc – population average response time of incongruent words)

The Dependent Samples t-Test is the appropriate statistical test as the same subjects are assigned two different conditions. The different conditions are dependent because by doing the first test you have some practice doing it and you might have an unfair advantage due to this learning effect in doing the similar type of test second. In addition, we don't have any population parameters provided (so a z-test would not be appropriate here).

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

CENTRAL TENDENCY-

Mean for congruent population is 14.051125

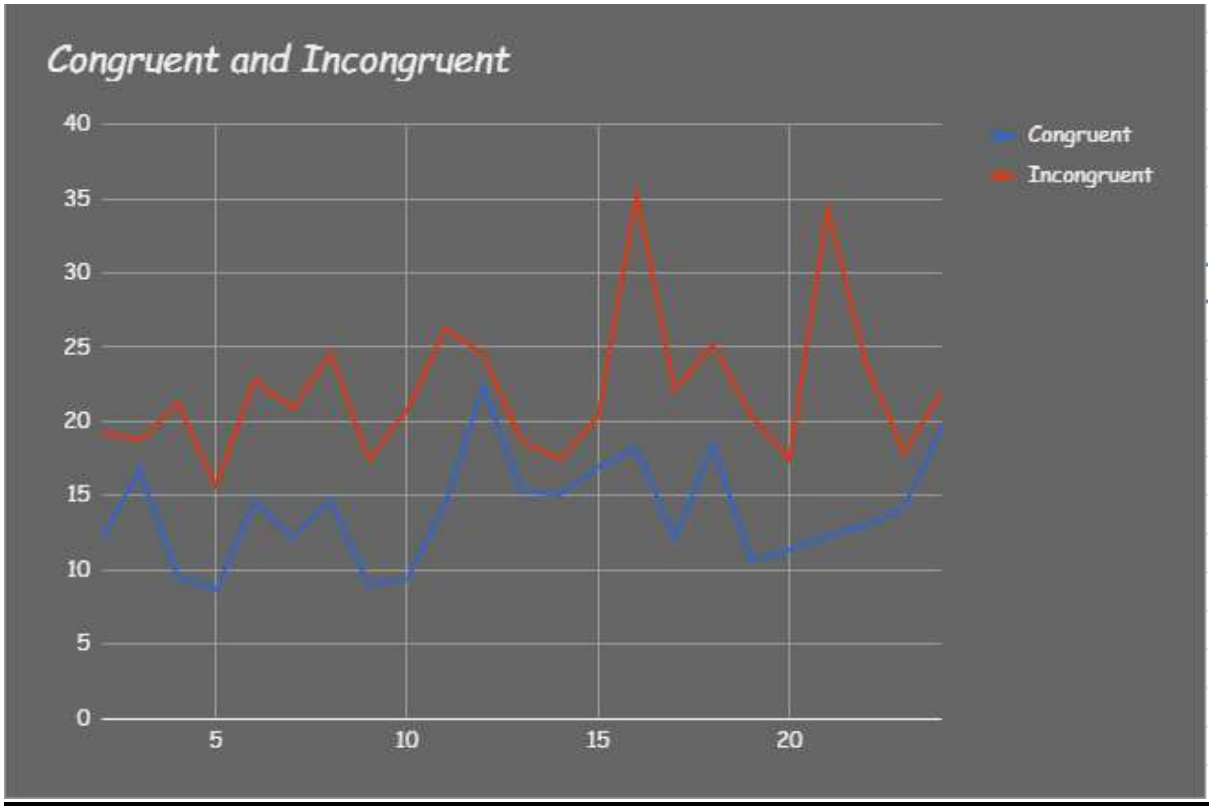
Mean for incongruent population is 22.01591667

VARIABILITY-

Standard deviation for congruent population is 3.559357958

Standard deviation for incongruent population is 4.797057122

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.



Clearly from the above graph we see that the time taken by incongruent words is more than congruent words.

Thus we can say that we can reject the **Null Hypothesis(Ho)** which states that there is no significant differences between the population average completion time for the two different conditions (Congruent & Incongruent), as that average completion time of incongruent words is higher than that of congruent words.

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?

N = 25 (sample size)

Confidence Level = 90%
DF = N - 1 = 24 (degree of freedom)
t-critical value = +- 1.711

Here to check the hypothesis we will have to perform t-test for paired sample.

μi = 22.016 (mean for incongruent data)

μc = 14.051(mean for congruent data)

$\mu d = \mu i - \mu c$ (difference mean)

= 7.964791667

s = 4.86482691 (SD of differences)

$$t = \frac{\mu d}{s/\sqrt{N}}$$

$$= \frac{7.964791667}{4.86482691/\sqrt{25}}$$

t = 8.186099746

since 8.186099746 > 1.711

i.e. t- statistics > t- critical

Thus we **reject** the Null Hypothesis(Ho) which states that there is no significant differences between the population average completion time for the two different conditions (Congruent & Incongruent).
These are the results I expected since by seeing the graph it seemed clear to me and also I myself observed that the second condition took me longer to complete

	A	B	C	D	E	F	G	H
1	Congruent	Incongruent	x and sd of con	x and sd of incon	D			
2	12.079	19.278	14.051125	22.01591667	7.199	7.964791667		0.9729653821
3	16.791	18.741	3.559357958	4.797057122	1.95	4.86482691		8.186099746
4	9.564	21.214			11.65			
5	8.63	15.687		μi - μc	7.057			
6	14.669	22.803		7.964791667	8.134			
7	12.238	20.878			8.64			
8	14.692	24.572			9.88			
9	8.987	17.394			8.407			
10	9.401	20.762			11.361			
11	14.48	26.282			11.802			
12	22.328	24.524			2.196			
13	15.298	18.644			3.346			
14	15.073	17.51			2.437			
15	16.929	20.33			3.401			
16	18.2	35.255			17.055			
17	12.13	22.158			10.028			
18	18.495	25.139			6.644			
19	10.639	20.429			9.79			
20	11.344	17.425			6.081			
21	12.369	34.288			21.919			

Sheet1