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

Independent Variable:Color Congruency to the words(i.e. whether the font name and colour were similar or different)
Dependent Variable:Recognition Time taken by the participants(i.e. reaction time between the stimuli and the responses)

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

The Appropriate set of hypothesis for this task are:

1.)Null Hypothesis($\mathbf{H_0}$):Difference between mean of population of congruent test and incongruent test is 0 i.e. Null.

2.)Alternative Hypothesis($\mathbf{H_a}$):Difference between the mean of populations of congruent and incongruent test is unequal.

Congruent test Mean = μ_{cong}
Incongruent test Mean = μ_{incong}

Also,
H_0:μ_{cong}=μ_{incong}

H_a:$\mu_{incong} \neq \mu_{cong}$

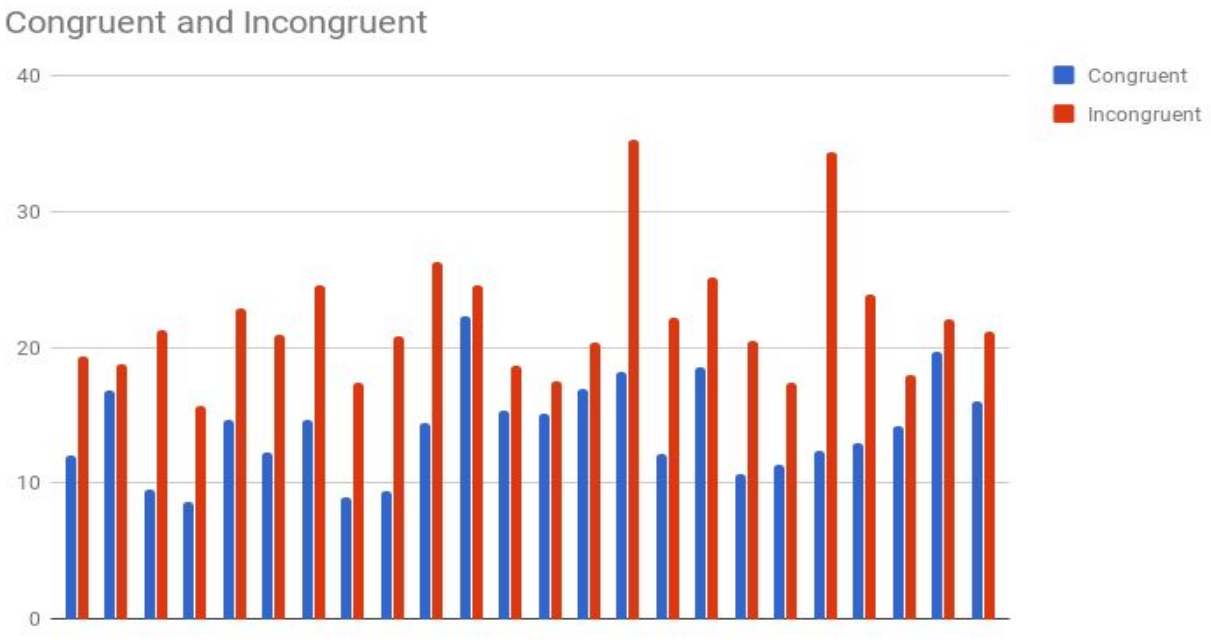
Explanation: The t-test has been used for the given hypothesis as the sample size was less than 30.
Standard deviation is not known.
We would have used z-test if sample size was more than 30 to calculate how many number of standard deviations away, the mean is.
I think that this t-test is paired as each person has two measurements recorded.

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 measures of the given dataset:

	Congruent	Incongruent
Mode	**14.36**	**21.02**
Standard Deviation	**3.56**	**4.80**
Mean	**14.05**	**22.015**

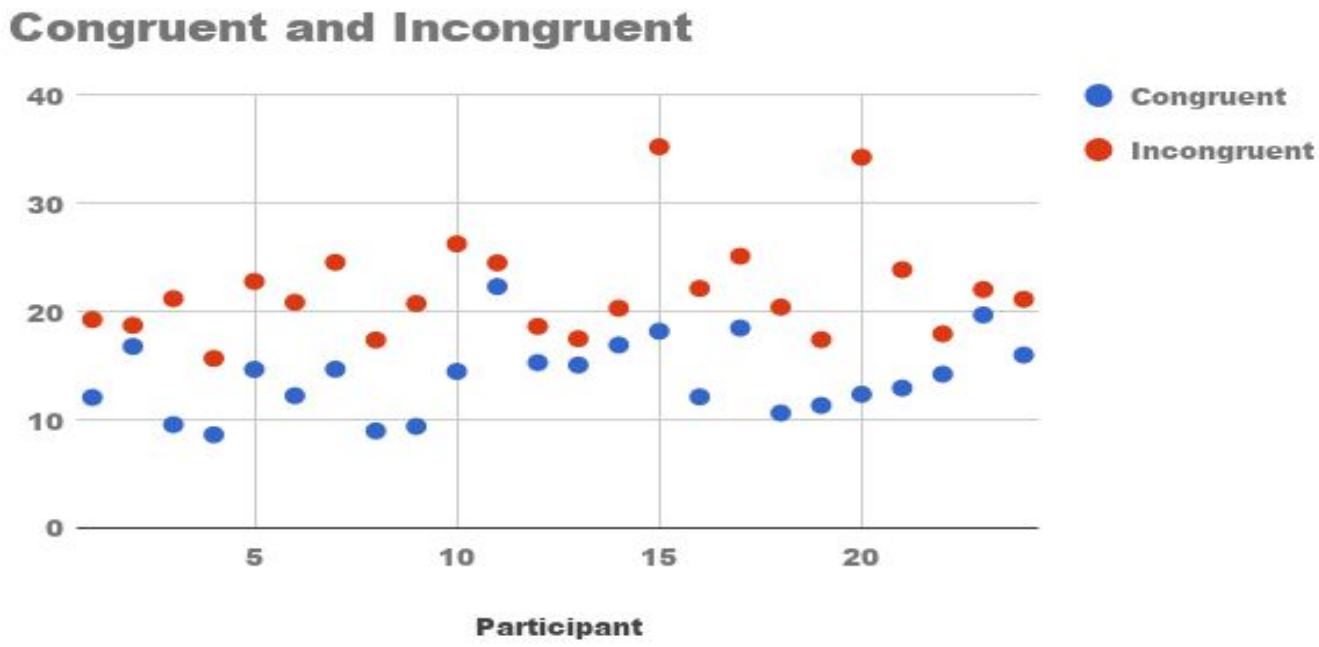
4. Provide one or two visualizations that show the distribution of the sample data. Write one or two sentences noting what you observe about the plot or plots.



#The Bar Graph was plotted from the given dataset(Stroop Effect Dataset)

This clearly shows that the Congruent test takes lesser time to be solved by the users as compared to the time taken by the users for completing Incongruent test.This proves that the STROOP EFFECT affects the reaction time.

Another dataset was also considered to validate this point(the results of which have been shown in the scatterplot below…).



5. Now, perform the statistical test and report your results. 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?

t-statistics = $(\mu_{incongruent} - \mu_{congruent})/(\text{Standard Deviation}/\sqrt{n})=8.02$

Confidence level aka alpha level=5%

t critical value=2.069
t statistics lies in critical region, this shows that the significance level is below the cut-off value we have set.Hence, we reject the null hypothesis.

Yes , my expectations matched with the result i got , as it was clear that the time taken by people to complete incongruent test is greater than the time to complete the congruent test.