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

Independent variable is the congruent word condition
Dependent variable is the time

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 same group of people (dependent sample of size 24) did 2 different tests (congruent and incongruent) and times are measured accordingly. We are interested to see the time difference between congruent and incongruent tests. Also, we are expecting to see the test result from congruent will be lower than incongruent (alternative hypothesis). 24 samples is used to estimate the population and to perform the hypothesis.

It is a dependent t-test for paired samples and 1 tailed T-test will be used.

n = 24
Uc : sample mean of congruent
Ui : sample mean of incongruent
Null hypothesis -> H0 : Uc - Ui = 0
Alt hypothesis -> HA: Uc - Ui < 0

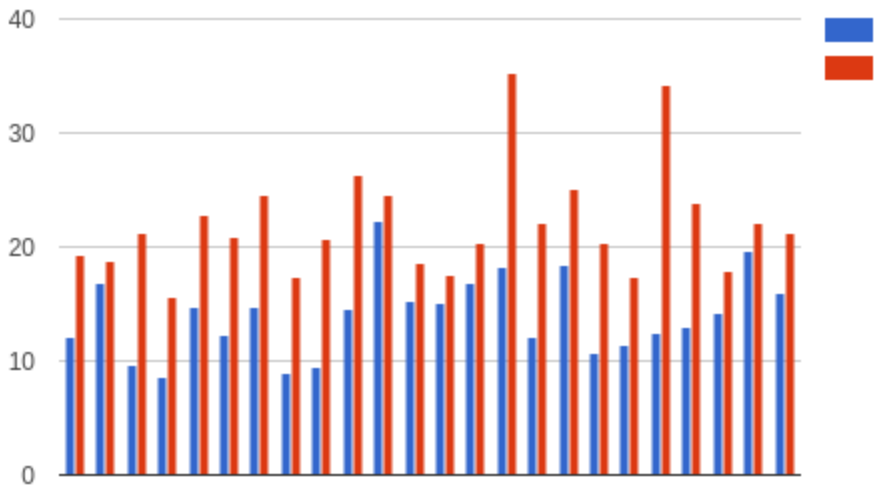
Now it's your chance to try out the Stroop task for yourself. Go to this link, which has a Java-based applet for performing the Stroop task. Record the times that you received on the task (you do not need to submit your times to the site.) Now, download this dataset which contains results from a number of participants in the task. Each row of the dataset contains the performance for one participant, with the first number their results on the congruent task and the second number their performance on the incongruent task.
3. Report some descriptive statistics regarding this dataset. Include at least one measure of central tendency and at least one measure of variability.

Congruent:
High: 22.328
Low: 8.63
Range: 13.698
mean: 14.051
Standard Deviation: 3.559

Incongruent:
Hight: 35.255
Low: 15.687
Range: 19.568
mean: 22.016
Standard Deviation: 4.797

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.

Red color presents incongruent data, and blue color presents congruent data for each person. Everyone spent more time in the incongruent test. The mean difference is 8.084.



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?

M-diff = -7.965
Alpha = .05
t -critical = -2.069
T-stat = (mean of congruent - mean of incongruent)/(S/sqrt(n)) = -7.965/(4.865/4.899) = -8.02
CI = M-diff +/- t-critical * (S/sqt(24)) = -7.965 +/- 2.069 * (4.865/4.899) = -10.75, -4.9

t-stat (-8.02) < t-critical (-2.069) which is outside of 95 % confidence level;
P value is less than .0001 which is less than .05 alpha
Therefore, we reject the null hypothesis.
We concluded that people spend less time to read congruent words than incongruent words as expected.

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!