Link to dataset-
https://drive.google.com/file/d/0B9Yf01UaIbUgQXpYb2NhZ29yX1U/view

Background Information-

In a Stroop task, participants are presented with a list of words, with each word displayed in a color of ink. The participant's task is to say out loud the *color of the ink* in which the word is printed. The task has two conditions: a congruent words condition, and an incongruent words condition. In the *congruent words* condition, the words being displayed are color words whose names match the colors in which they are printed: for example, RED, BLUE. In the *incongruent words* condition, the words displayed are color words whose names do not match the colors in which they are printed: for example, PURPLE, ORANGE. In each case, we measure the time it takes to name the ink colors in equally-sized lists. Each participant will go through and record a time from each condition.

Our independent variable is whether the words shown are congruent with the ink colors or if they are incongruent with ink colors and dependent variable is the time individual takes to name the ink colors in equally-sized lists. We are testing it on two different conditions (congruent and incongruent).

We expect that incongruent condition will result in increase in time it takes to name the color. Our null hypothesis will be that changing condition does not impact time duration and our alternative hypothesis will be that it increases time duration.

 Let's look at histogram of Congruent condition data-

congruent condition
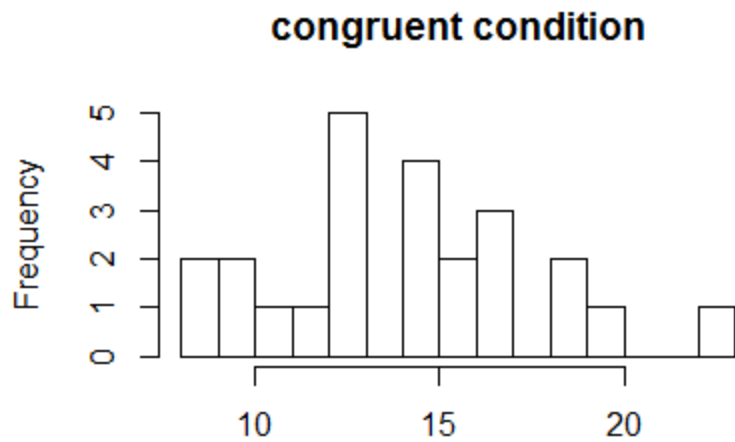
It's reasonable to believe that this distribution is Gaussian.

Let's look at Histogram of Incongruent condition

Incongruent condition
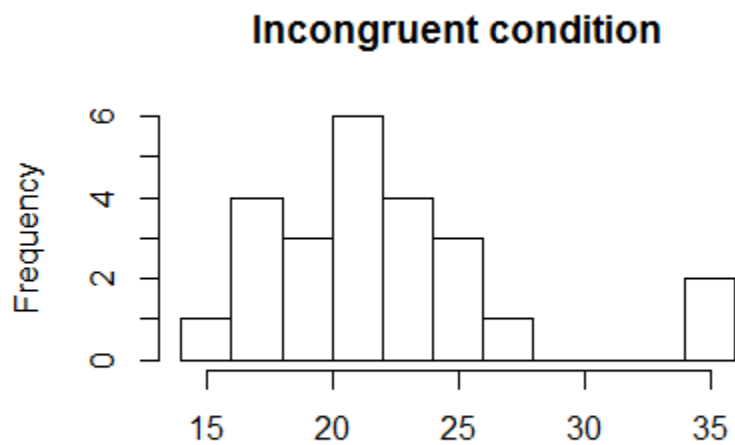
It's reasonable to believe that this distribution is Gaussian.

Since **sample size is small** and we **are not provided Population Parameters**. Our test samples are **dependent** because of the way experiment is conducted.
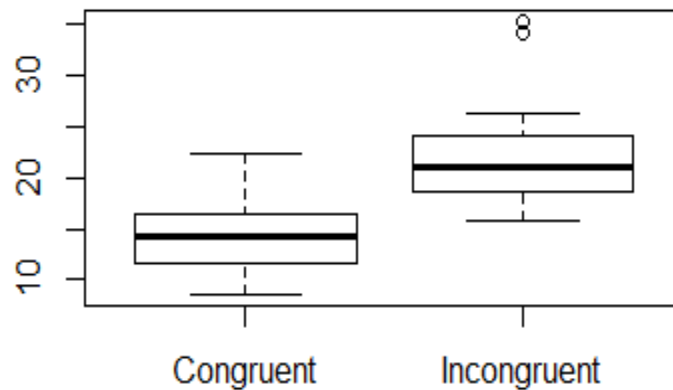
Assuming the distributions are Gaussian so we will perform one tail t-test.

	Congruent	Incongruent
Sample Mean	14.05113	22.01592
Sample Median	14.3565	21.0175
Sample Standard error	3.559358	4.797057

Difference of time in Congruent and Incongruent conditions
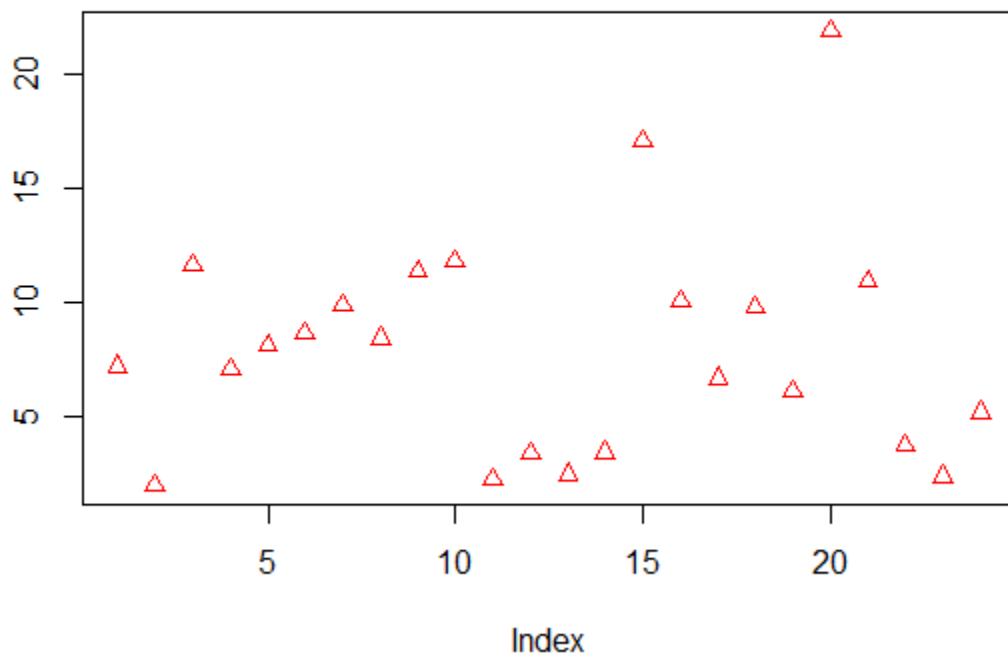
From plot, we can see that in each case there is increase in time in the range 1.95 to 21.9.

We can see that time taken is generally quite higher in Incongruent condition in comparison to congruent condition.

We denote average time take in congruent condition by X_bar _congruent and average time take in congruent condition by   X_bar_Incongruent. They are sample means of time spent naming the words.

Null Hypothesis is that Changing conditions to incongruent does not impact time taken.

H0:   mu _congruent =   mu_Incongruent

Alternative Hypothesis is that Changing condition to incongruent increases time taken.

HA: mu _congruent <   mu _Incongruent

- We don't know the population's standard deviation.
- We assume that the distributions are Gaussian.
- We have less than 30 samples.

So It will be a **one tailed t-test** in positive direction.

degree of freedom	23
t-critical value	t (23) = 1.713872
Standard error of mean	4.864827
Alpha	0.05
Mean difference	7.964792
t-statistic	8.0207
critical region	(6.262868, Inf)
P-Value	2.052e-08
Decision	reject the null hypothesis
Cohen's d	1.64
R^2	0.7366361

we can say that it takes significantly longer to complete the incongruent-condition task than the congruent-condition task. It is because our mind reads and visualizes the same time. In Incongruent condition conclusions made by mind are not same, so it takes some time to find which results to trust more.

Similar tasks like studying with distraction (social media) will result in poor retention and concentration.