

# Assignment-1

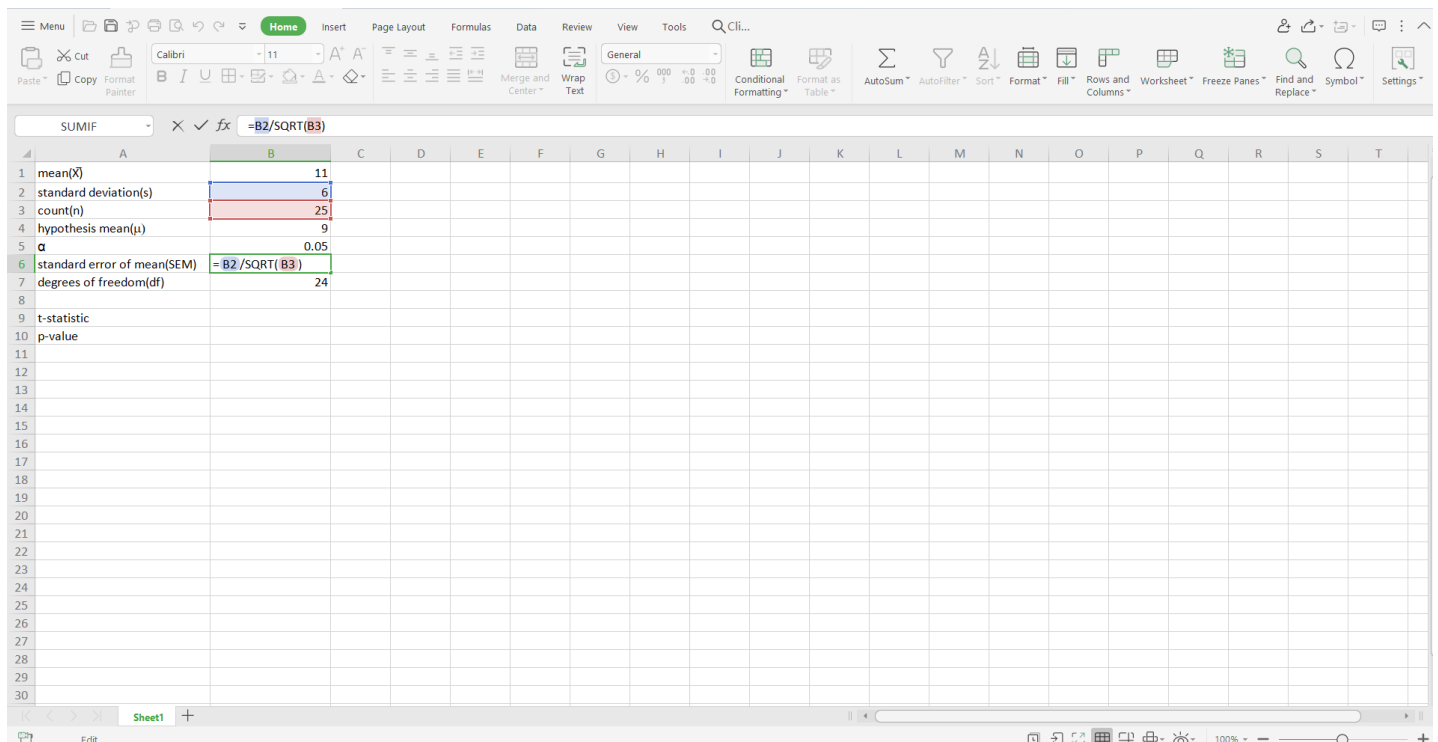
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**SUBJECT** : Essential Statistics for Data Science  
**Date** :22-01-2021

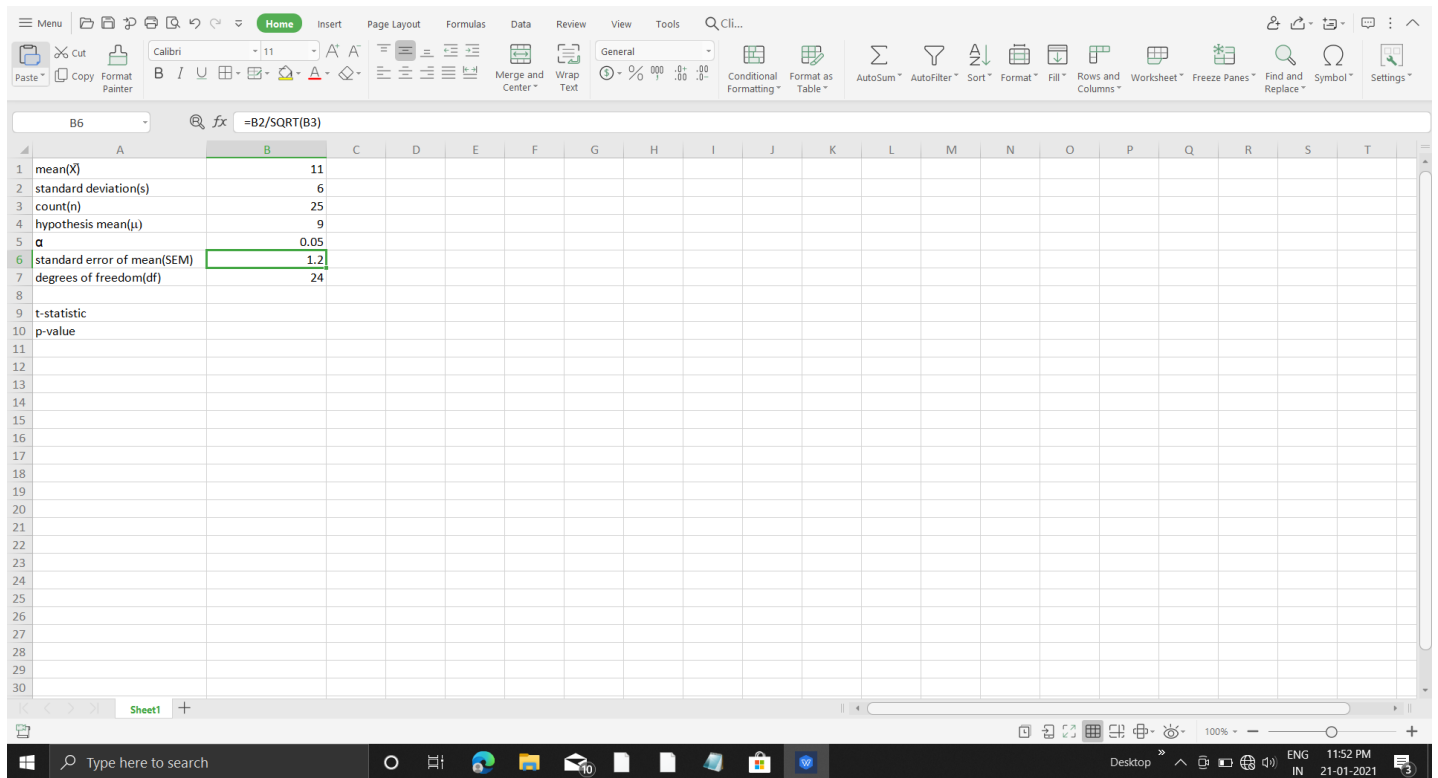
## 1.Problem:

People in the United States report having an average of nine close friends, not counting relatives. A psychologist believes that extroverts have more friends than the national average. The mean for a sample of  $n = 25$  extroverts was  $M = 11$  with a  $s = 6$ . Do extroverts have significantly more friends than the general population? Test at  $\alpha = .05$ .

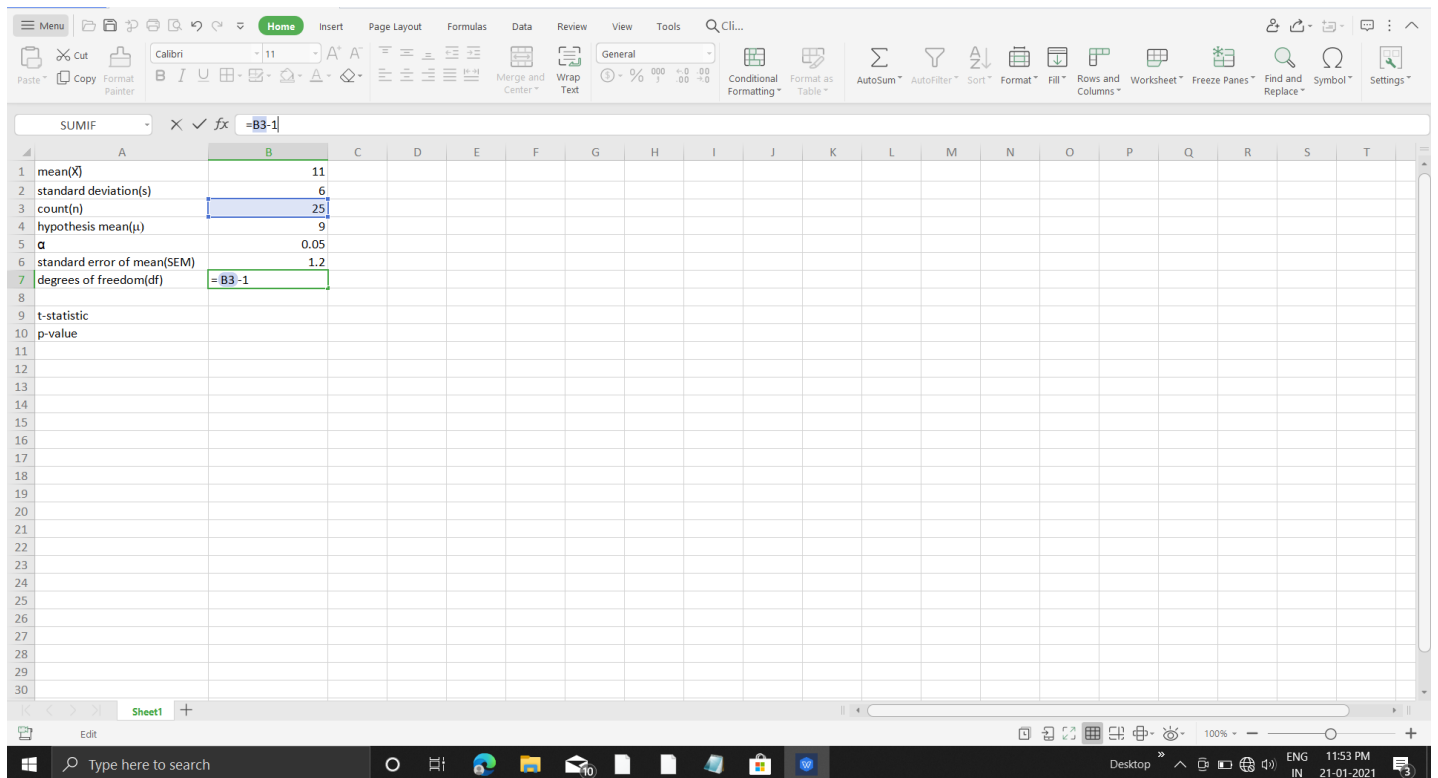
## 2.Screenshots of all the function used in Excel:

1) To find Standard error of mean:





2) To find Degrees of freedom:



The screenshot shows an Excel spreadsheet with the following data in column B:

	A	B
1	mean( $\bar{X}$ )	11
2	standard deviation(s)	6
3	count(n)	25
4	hypothesis mean( $\mu$ )	9
5	$\alpha$	0.05
6	standard error of mean(SEM)	1.2
7	degrees of freedom(df)	24
8	t-statistic	
9	p-value	

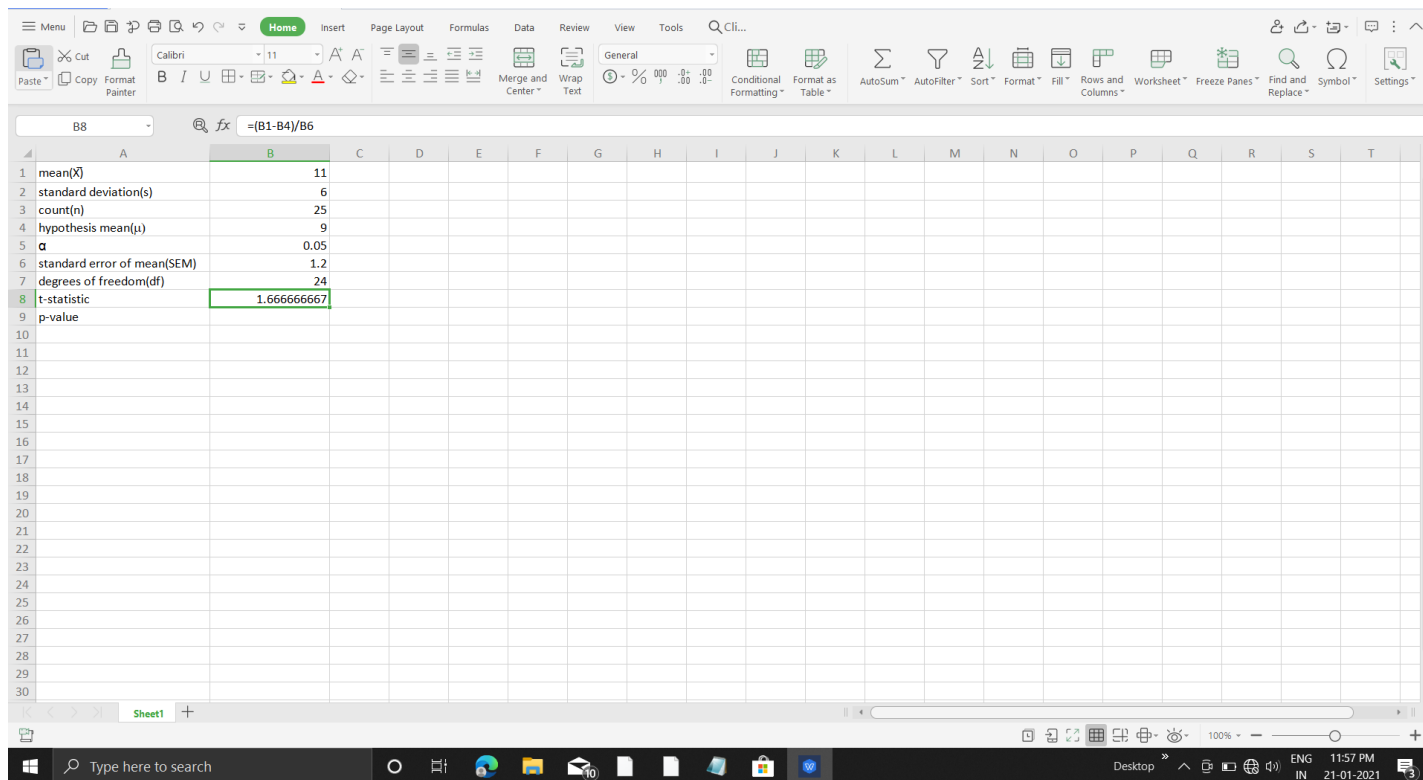
The formula bar shows the formula  $=B3-1$  for cell B7.

3)To find t-statistic:

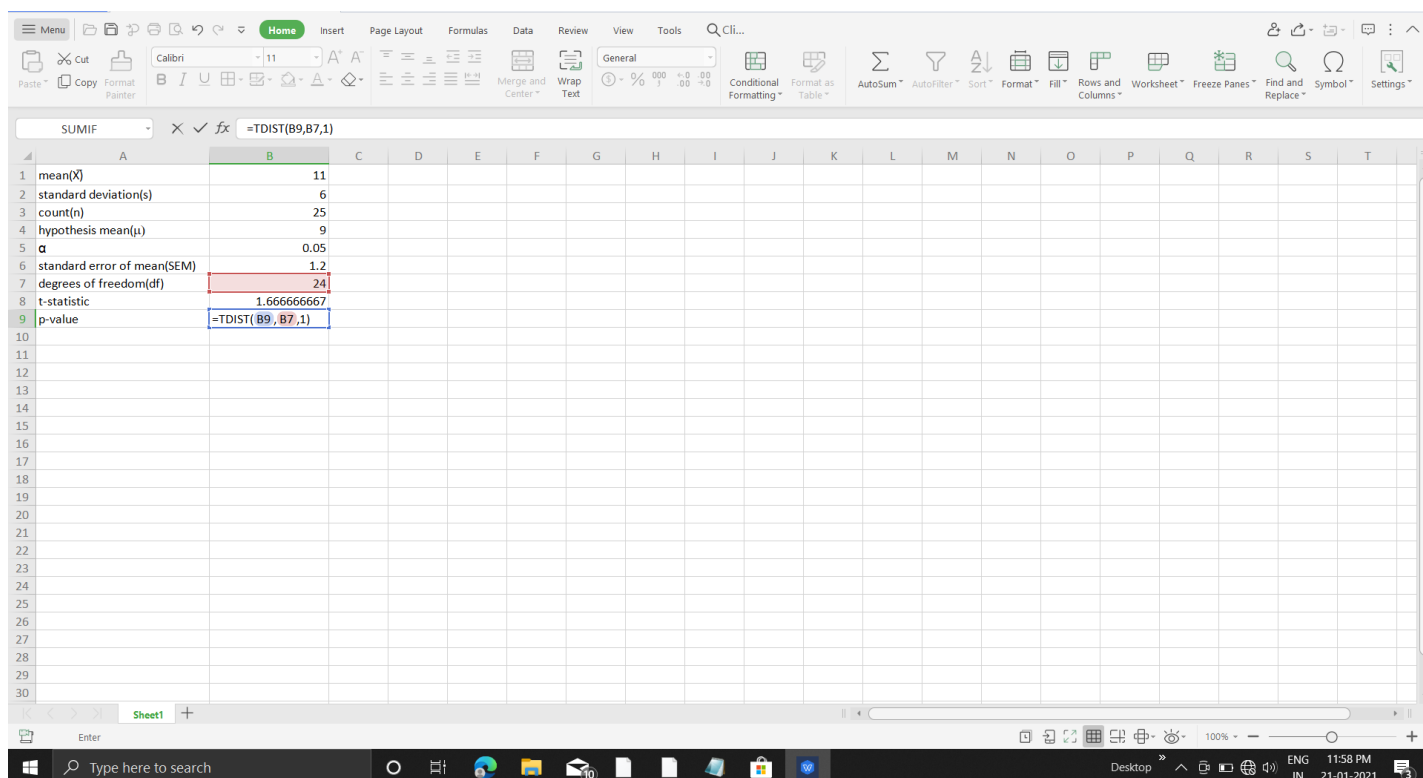
The screenshot shows the same Excel spreadsheet with the following data in column B:

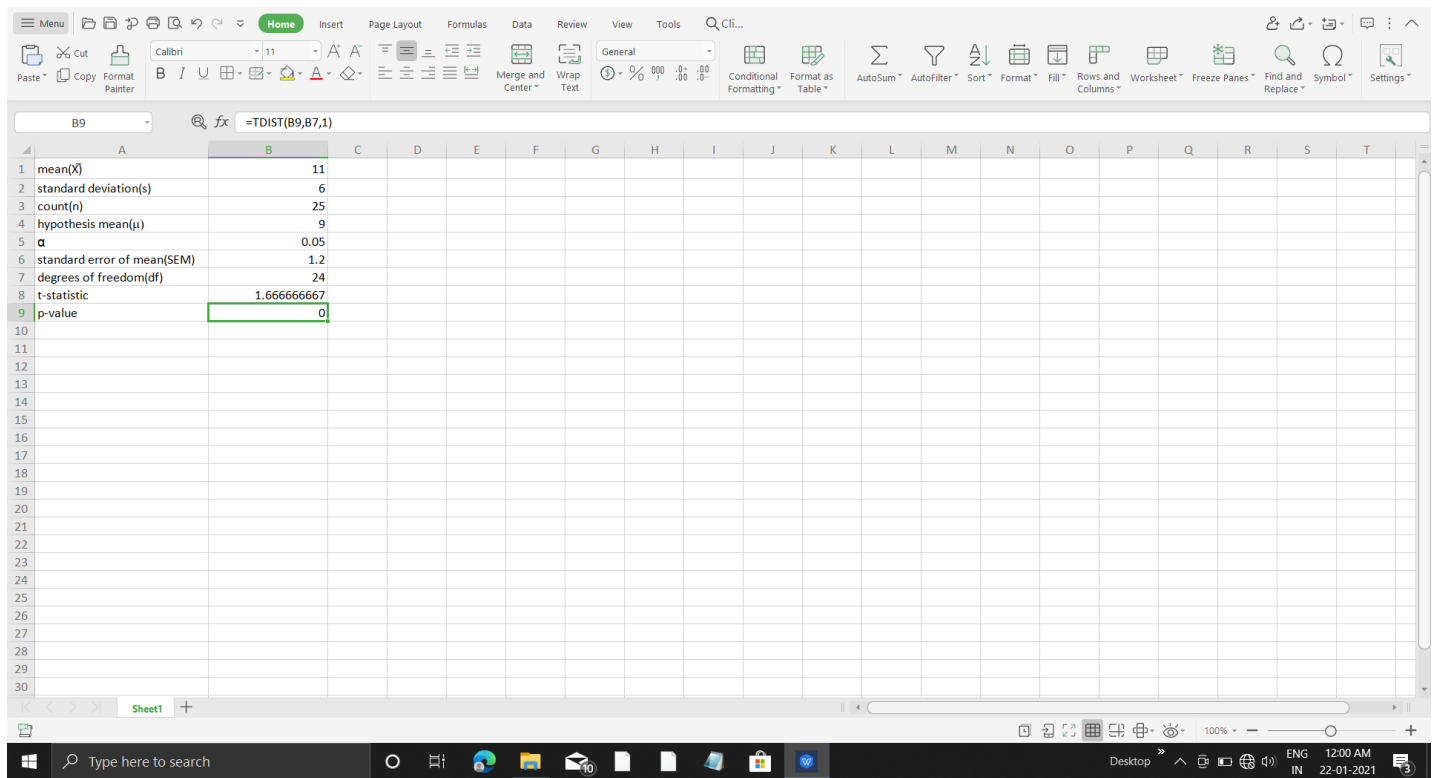
	A	B
1	mean( $\bar{X}$ )	11
2	standard deviation(s)	6
3	count(n)	25
4	hypothesis mean( $\mu$ )	9
5	$\alpha$	0.05
6	standard error of mean(SEM)	1.2
7	degrees of freedom(df)	24
8	t-statistic	$=(B1 - B4) / B6$
9	p-value	

The formula bar shows the formula  $=(B1 - B4) / B6$  for cell B8.

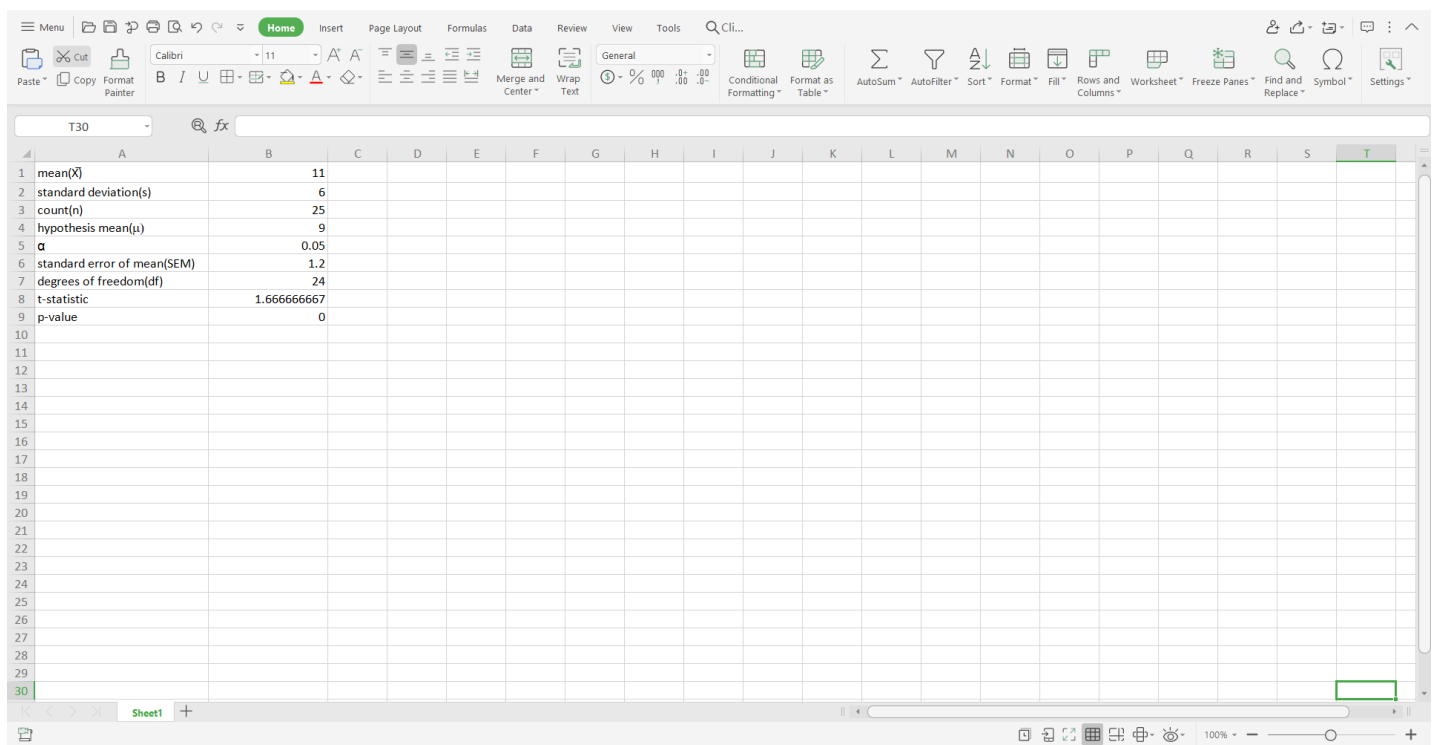


4) To find p-value:





5)After all calculations:



### 3.Result analysis:

We set the hypothesis as:

**H<sub>0</sub>:**

There is no sig difference that extroverts have more friends than introverts.

**H1:**

Extroverts have significantly more friends than introverts.

Since, p-value is greater than 0.05 ( $0.5429 > 0.05$ ), we reject null hypothesis  $H_0$  and accept alternate hypothesis  $H_1$ .

**4. Conclusion:**

I conclude that the calculated value 1.667 and the p value 0.054. Therefore, the P-value is less than (or equal to) 0.05 and hence the null hypothesis is rejected in favor of the alternative hypothesis. i.e., the sample extroverts have significantly more friends than the population.