Performing Hypothesis Testing for One-sample t-tests in Excel 2016

You should already have the Excel tutorial file open.

1. Copy a single continuous variable into a new sheet. In this case we will copy "Phone Time."
2. Create a table as the one on the right in order to arrange the necessary information for calculating the t-statistic.
3. Calculate the mean, standard deviation, and n in blank cells next to the variable:
    - Mean: **=AVERAGE([select data])**
    - Standard deviation: **=STDEV([select data])**
    - n: **=COUNT([select data])**
4. Calculate the standard error. Divide the standard deviation by the square root of the number of cases of data, n.
    - SE: **=[standard deviation]/SQRT(n)**
5. Calculate the degrees of freedom. Subtract 1 from n.
    - DF **=[n]-1**

Phone Time	
12	Mean
1.5	SD
25	Sample Size
30	SE
23	DF
13	
23	
50	

For Hypothesis test:

6. To find the t-statistic, you use the mean and standard error you calculated above. If the null hypothesis assumes a mean of **μ,** then the t-statistic is calculated with this equation.
    - t stat **=([Mean]-[μ])/[SE]**

    Click on the cell values which you previously calculated to include them in the t-statistic equation.

After you calculate the appropriate t-statistic based on the **μ** value given in the problem. Then:

7. To find the p-value for a *right-sided* or *greater than* alternative hypothesis test:
    - p-value: **=T.DIST.RT([t stat],[DF])**
    - t-critical: **=T.INV(0.95, [DF])**
8. To find the p-value and t-critical for a *left-sided* or *less than* alternative hypothesis test:
    - p-value: **=T.DIST([t stat],[DF],TRUE)**
    - t-critical: **=T.INV(0.05, [DF])**
9. To find the p-value for a two-sided alternative hypothesis test:
    - p-value**: = T.DIST.2T([t stat],[DF])**
    - t-critical: **=T.INV.2T(0.05, [DF])**

    ***NOTE: When using two-tailed tests in Excel, you will get an error message if your t-statistic is negative when calculating the p-value. Additionally, the t-critical

provided will always be positive. For the p-value always type in a positive t-statistic and compare your t-statistic (disregarding original sign) to the t-critical provided.

For Confidence Intervals:

10. If you would like to calculate a confidence interval for a two-sided test, multiply the standard error by the critical value t*. To find t*:
    - For a 95% confidence interval, calculate t* (t-critical). =**T.INV.2T(0.05,[DF])**
11. The 95 % confidence interval is found by using the equations **=[mean] + (t*× SE)** for the upper bound, and **=[mean] - (t*× SE)** for the lower bound