## Chapter 18:   1-sample-t command in Minitab 17

for confidence intervals and hypothesis tests on one mean

In this document, find

- Computing the p-value for a hypothesis test on one mean
- Computing a confidence interval of one mean
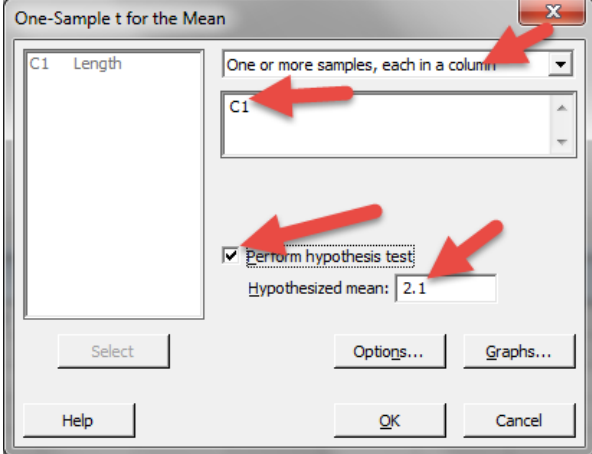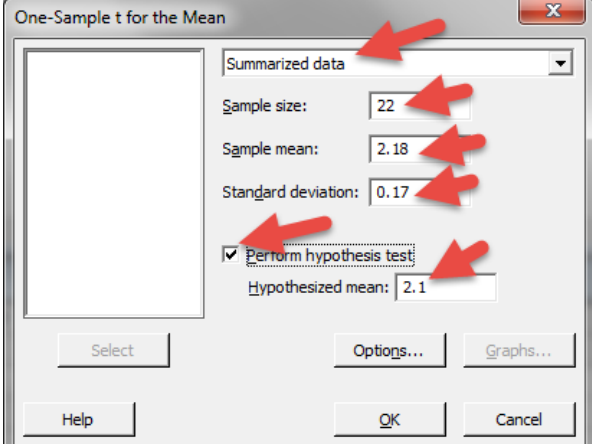- Choosing to graph the data, if you have a full dataset instead of summarized data

The first step is to choose the menu Stat > Basic Statistics and then make an appropriate choice for your data.   For one mean, it is either the 1-sample Z (if we know the population standard deviation) or 1-sample t (if we must use the data to estimate the population standard deviation.) In Ch. 18, we are estimating the pop'n stdev so we use the 1-sample t.
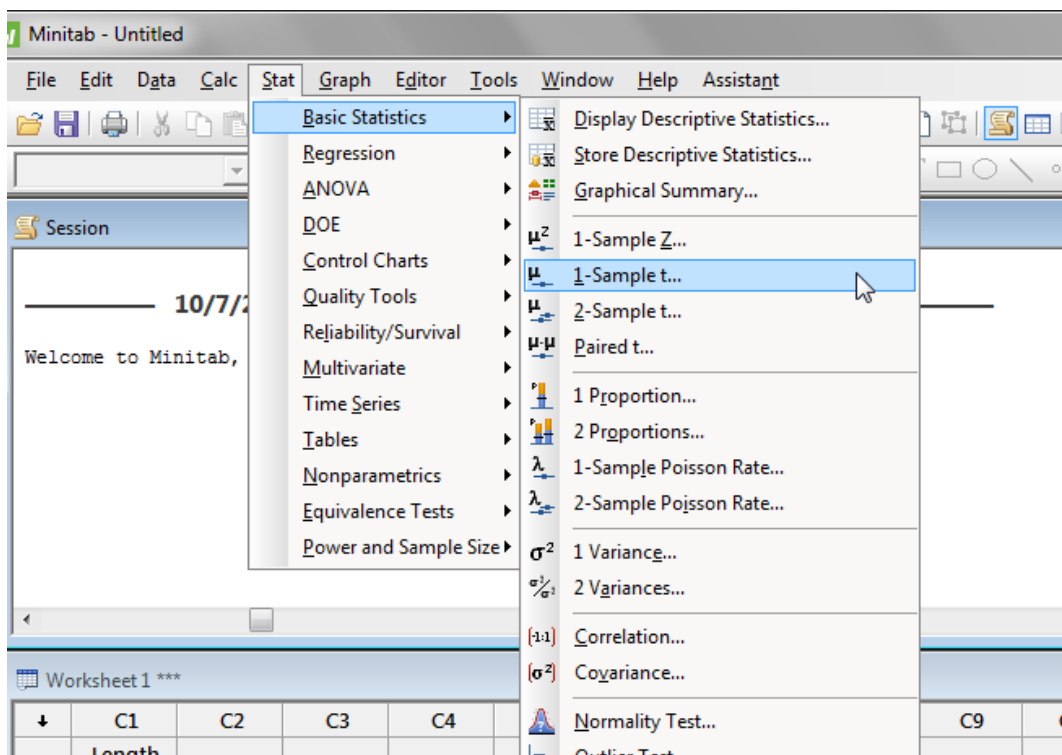
See the dialog box on the next page here.

Notice that the drop-down box at the very top gives two choices for the data.   You must choose whether you are giving it a full data-set in one of the columns of the worksheet, or whether you are ignoring all columns in the worksheet and just giving the summary statistics of your data.   (Some of the problems in our text give you only the summary statistics instead of the full dataset.)   Both choices are illustrated here.

Note that the "Graphs" button is only available when we have the individual data values because we could not produce a graph of the data from just the value from the summarized data. That is illustrated at the end of this document.

One or more samples, each in a column (We will only use one sample here because we're only doing one t-test at a time.)	
	One-Sample t for the Mean
C1 Length	One or more samples, each in a column
	C1
	☑ Perform hypothesis test
	Hypothesized mean: 2.1
1 2.4	
2 2.1	Select Options... Graphs...
3 2.3	
4 1.9	Help OK Cancel

Summarized data	**One-Sample t for the Mean**
Type into the dialog box the following information:	Summarized data
	Sample size: 22
	Sample mean: 2.18
	Standard deviation: 0.17
• Sample size	☑ Perform hypothesis test
• Sample mean	Hypothesized mean: 2.1
• Sample standard deviation	
	Select Options... Graphs...
	Help OK Cancel

The same dialog box is used to do either a confidence interval or a hypothesis test.

I am testing Ho: mu = 2.1   versus Ha: mu > 2.1

I check that box in the dialog box shown above and enter the mean from the null hypothesis in the "Hypothesized mean" box.

After you have entered these, then choose the Options button.

Since I am only interested in a hypothesis test, I ignore the confidence interval choice. It automatically comes up as 95%, so I just leave it there.

There are three choices in the drop-down list for the choices for the alternative hypothesis, which are

- Mean ≠ hypothesized mean
- Mean < hypothesized mean
- Mean > hypothesized mean

Since my alternative hypothesis is right-tailed, I chose the option

Mean > hypothesized mean

Then I choose OK in that dialog box, taking me back to the previous one, and then choose OK in the main dialog box.
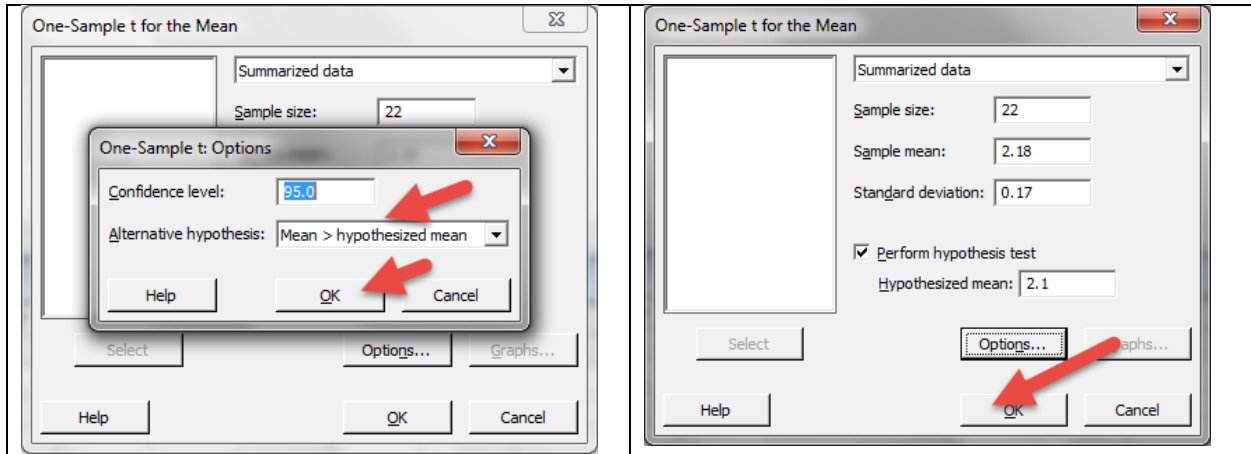
And here's the output from the summarized data, showing that the p-value for our test is 0.019.
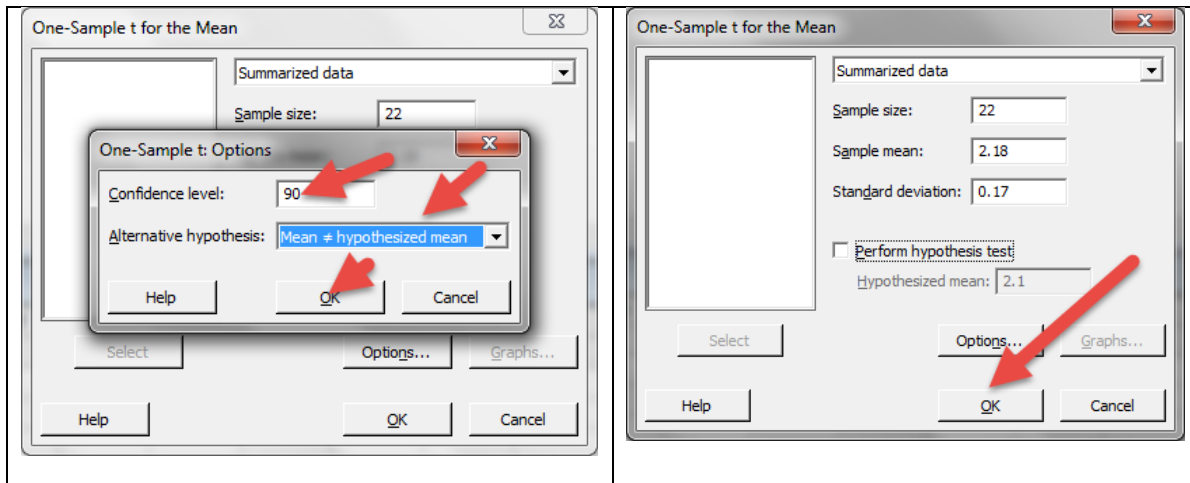
One-Sample T

Test of μ = 2.1 vs > 2.1

N	Mean	StDev	SE Mean	95% Lower Bound	T	P
22	2.1800	0.1700	0.0362	2.1176	2.21	0.019

|

Worksheet 1 ***

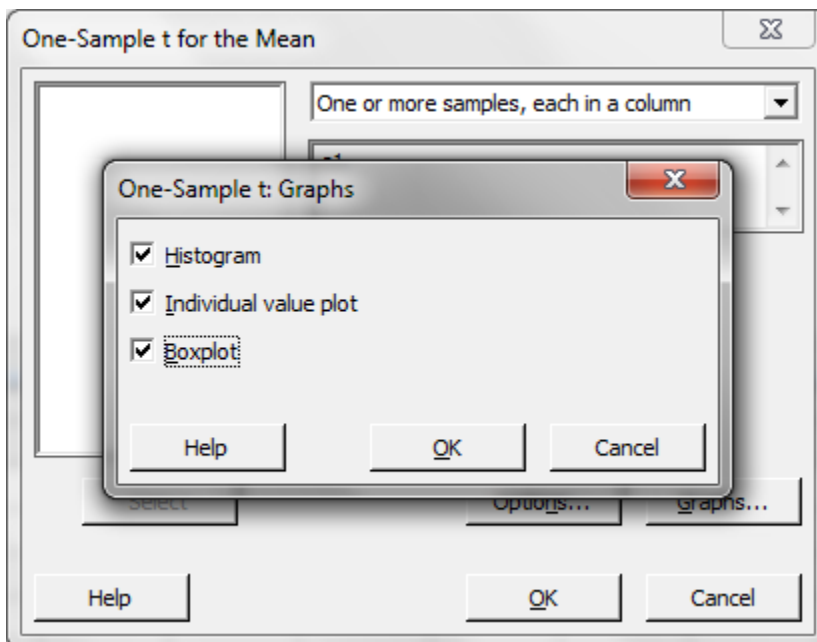|	C1	C2	C3	C4	C5	C6
	Length					
1	2.4					

Now I want a 90% confidence interval, so I choose two-sided alternative hypothesis option.

One-Sample T

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 N    Mean   StDev  SE Mean         90% CI
22  2.1800  0.1700   0.0362  (2.1176, 2.2424)
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When you have the full data set and the Graphs button is available, then you may choose any or all of the following graphs to obtain a picture of the data.

The Individual Value Plot is similar to a dotplot, but the dots are just put on top of each other instead of stacked up.   Histograms and Boxplots are as described in our course.