STAT 269 - Introductory Statistics
Minitab Homework 6 (Unit 3 Part 1)

- Open Minitab and in the "Session" window at the top of the screen, type your name.

- In this homework, you will be conducting a hypothesis test, with Minitab's help.

- Minitab will not do all of the steps for you. You will need to type the steps into the session window, and use Minitab results where they are helpful.

- Consider the following problem:

  - A restaurant association says the typical household in the US spends \$2698 per year on average on food away from home. Data from the US Bureau of Labor Statistics indicated that in a random sample of 28 US households, an average of \$2764 was spent on food away from home with a standard deviation of \$322. Is this enough evidence, at the 0.05 level, to conclude that the association is wrong?

- Label each step with a step number, and the "Title" of that step.

- Write out the hypotheses step, using "H0" and "Ha" is fine. You do not need to use subscripts. Be sure to define μ. You may also use "mu" for μ.

- Write out the assumptions.

- Use Minitab to find the appropriate rejection region. Use "Probability Distribution Plot..." to put the $\alpha = 0.05$ in the appropriate tail(s). Be sure to state the rejection region in the Session window for this step. Be careful to think about which distribution you should be using here.

- Use Minitab to calculate the Test Statistic. Using the let command you can do this in one step! You should plug your values into something like: "let k1=(xbar-mu)/(sd/sqrt(n))". You can even name k1 by typing "name k1 'TS' " at the MTB> prompt. Then print k1, and you should be able to clearly state your answer.

- Use "Probability Distribution Plot..." to obtain the P-value, using the correct tail(s). Once again, be careful to think about which distribution you should be using here.

- State the reasoning for your conclusion, as well as the conclusion in statistical terms. (Do not number this work, since it is not one of our six steps.

- State the conclusion in plain English.

- Make a clear break in your Session window, then complete the following steps.

- Comment on whether Case 1 or Case 2 is more appropriate here.

- Now, select the "Stat" menu, and then "Basic Statistics" then choose whichever case you chose above. (Either "One-sample Z" or "One-sample t".) In the dialog box, check "Summarized Data". Enter your sample size, sample mean, and standard deviation in the appropriate boxes. Check "Perform hypothesis test" and enter the μ_0 value. Now click "Options...", and make sure the correct alternative is chosen. In the "Confidence level" box, enter the 1-α value times 100. (That is: if *alpha* is 0.1, then Confidence level is 90.) Click "OK", and the "OK".

- Comment on how well this agrees with the work you did above. What has Minitab given that we found ourselves? What isn't given? What is given that we haven't looked at before?

- Copy each of the graphs into Word (or your favorite package) on one page. Print these from Word (to save paper!). Be sure to put them in the correct order.

- Print the session window. Staple this on top of the graphs, and turn them in.