MATH 2240 – Problem Set #2 Due Friday, January 25

Use Minitab for all calculations!

1. Read pages 59 and 60 in our textbook and then download the QUAKE file from the course webpage. We would like to study the population of all 2929 aftershocks. (So this file contains the entire population.)

   (a) Find, and interpret, the five-number summary of the magnitudes. Be specific!

   (b) Copy and paste the first twenty magnitudes into a new column. Use this sample to find, and interpret, a 95% confidence interval for μ. (Select Stat→Basic Statistics→1-Sample t….) Does your interval contain the true value of μ (which is about 2.12)? Are you surprised? Why or why not? (**Note:** This is a type of what is called a convenience sample.)

   (c) Select 20 random magnitudes and enter them into a new column. (The easiest way to do this is to select Calc→Random Data→Sample From Columns…, then type "20" in the first box, "MAGNITUDE" in the second box, and "RANDOM" in the third box.) Use this sample to find, and interpret, a 95% confidence interval for μ. Does your interval contain the true value of μ (which is about 2.12)? Are you surprised? Why or why not? (**Note:** This is called a simple random sample.)

2. Do problem 7.48 on p. 336 (all four parts!). The data can be found in the SKID file on the course webpage. Include a boxplot to justify your answer to part (c), and explain your reasoning for part (d).

3. Read the scenario in Problem 9.14 on p. 448 in our textbook, then use Minitab to test the hypothesis that the average response time is different between the two groups. (Under "2-Sample t…" select "Summarized data" from the drop down menu.) Show all five steps! If the difference is significant, use the given confidence interval to give your "post-hoc analysis". Are you surprised at your result (I certainly was!)? Explain.