Homework 1

Use R to complete all of these problems from the textbook. In your write up include the code and output. Please upload your asignment in pdf or docx form to SAKAI

1. Chapter 3, Problem 3
   Assume that Z is a random variable from the standard normal, calculate the missing value of the probability statement in R.

   (a) $P(Z \geq -1) = ?$

   (b) $P(Z \leq ?) = 0.20$

2. Chapter 3, Problem 6
   $F_{(a,b)}$ is a random variable from the F-distribution with df1 = a, df2 = b. Calculate the missing value of the probability statement in R.

   (a) $P(F_{6,24} \geq ?) = 0.05$

   (b) $P(F_{5,40} \geq 2.9) = ?$

3. Chapter 3, Problem 9
   Find the (a) mean, (b) median, and (c) variance for the following set of scores

   $$0, 2, 5, 6, 3, 3, 3, 1, 4, 3$$

4. Chapter 3, Problem 13

   A random sample of 32 persons attending a certain diet clinic was found to have lost an average of 30 pounds over a three week period, with a sample standard deviation of 11 pounds. For these data, find the 99% confidence inteval **AND interpret the confidence interval**.

5. Non textbook problem
   An outbreak of Salmonella-related illness was thought to be do pre-cut melons from a specific factory. Several samples were collected and can be found in the file salmonella.txt. A Salmonella level (in MPN/g) greater than 0.3 MPN/g is considered dangerous. To demonstrate that the levels are safe we want to show the mean level is less than 0.3 MPN/g.

   (a) State the null and directional alternative hypothesis in symbols. Define what μ represents.

   (b) Find the test statistic and p-value for the data below. Be sure to clearly identify them from your output. Note you are performing a one-sided test. You will need the *alternative* = argument in the *t.test* command. For an example refer to
   `http://www.instantr.com/2012/12/29/performing-a-one-sample-t-test-in-r/`

   (c) Clearly state your conclusion at a significance level of $\alpha = 0.05$