1. The 1997 season for NCAA football saw a split national title—the final AP poll gave the title to the U. of Michigan Wolverines while the final Coaches' Poll awarded their title to the U. of Nebraska Cornhuskers. This split championship was the tenth such occurrence in the previous 25 years, sparking a discussion about the effectiveness of the Bowl Alliance. In June 1998, the football conferences announced their solution, the Bowl Championship Series (BCS) system. Below are the points scored per game during the 1997 season for the two schools (The first Nebraska game, 59-14 win vs. Akron was omitted. Source: *Wikipedia*).

Wolverines:	27	38	21	37	23	28	23	24	34	26	20	21
Cornhuskers:	38	27	56	49	29	35	69	45	77	27	54	42

   (a) Draw a back-to-back stem-and-leaf display of the two point distributions. Put the Wolverines on the left side of the stem, and the Cornhuskers on the right side. Remember to give a key or legend (e.g., $1|4 = 14$), so the reader can interpret the display.

   (b) Construct a frequency table and histogram for the **Cornhuskers'** point distribution. Your table should have to following column headings: points, frequency, relative frequency. Choose a 10-point interval—large enough so the data are grouped together (there should be few intervals with zero or one data points), but yields enough intervals to adequately show features of the distribution.

   (c) From this histogram, describe the **Cornhuskers'** point distribution. Is it unimodal or bimodal? Is it symmetric or skewed? If skewed, in which direction?

   (d) For **both** the Cornhuskers and the Wolverines, calculate the first quartile, the second quartile (median), the third quartile, the range, and the interquartile range (IQR).

   (e) Construct side-by-side boxplots comparing the data for the Wolverines and the Cornhuskers. Make the axis range from 20 to 80 points in increments of 10. Based on the boxplots, are there *unusual* observations for either school?

   (f) Calculate the sample mean, sample variance, and sample standard deviation for each school. Clearly label your answers.
   Hint: for the Wolverines $\sum_{i=1}^{12} x_i = 322$, $\sum_{i=1}^{12} x_i^2 = 9074$,
   and for the Cornhuskers $\sum_{i=1}^{12} x_i = 548$, $\sum_{i=1}^{12} x_i^2 = 27900$.

2. Below are the ages of all 44 U.S. presidents at inauguration, measured in years. The data has been sorted for you.

42	43	46	46	47	47	48	49	49	50	51	51	51	51	51	52	52	54
54	54	54	54	55	55	55	55	56	56	56	57	57	57	57	58	60	61
61	61	62	64	64	65	68	69										

   (a) Construct a stem-and-leaf plot of this data. (Hint: use interval size of 5 as I mentioned in class.)

   (b) Do you think that these data come from a normal probability distribution? Justify your answer.

   (c) Given your answer for (2b), which is more appropriate to use to describe this data set, the mean and standard deviation or the median and IQR? Explain. (Hint: see top part of p. 217 and beginning of 8.2.6 on p. 222.)

3. Baron 9.4, p. 301. For both Method of moments estimator and Maximum Likelihood estimator. **The answers for both parts are in back of book, so you need to show the exact fraction for the MLE. Show all of your work to get full credit.**

   Hint for MOME: you will need to compute the mean of this continuous density, see Chapter 4.

   Hint for MLE: don't forget about taking the logarithm.

4. Baron 9.3, part c. p. 300. In this part, you assume σ is known, so treat that as a constant. Hint: take the logarithm early on. Assume you have $X_1, X_2, \dots, X_n \sim$ iid Normal(μ, σ^2).

5. Baron 9.3, part a. p. 300. Think about what happens to your likelihood function that is a function of a and b as you change those parameters. Assume you have $X_1, X_2, \dots, X_n \sim$ iid Uniform(a, b).