Stat 462: Lab 4

For this lab, do the following exercises from DAAG:

- 3.3 (in SAS, PROC SURVEYSELECT is available for random sampling. Other methods are also possible, in particular the RAND function.)
- 3.4 (in SAS, the RAND function is available for generating random Normals.)
- 3.11 (in SAS, the RAND function is available for generating random Poissons.)
- 3.13 (Stat 862 students only)

In addition, locate a data set of interest to you (this could be the same data set as Lab 3), and calculate the mean and standard deviation of one variable of your choosing. Plot the distribution of the variable – does it appear to be Normally distributed? Call n the number of data points in your sample for the variable of interest. Do the following:

1. Draw n samples from your variable (with replacement). With replacement means that after drawing one sample, that data point goes "back in the bag" and can be drawn again.
2. Calculate the mean and variance of the sampled data you generated in step 1. Save this mean and variance.
3. Repeat steps 1. and 2. to obtain 1000 means and variances.
4. Plot the distribution of the 1000 means and variances. What shape do these distributions have? What shape would you expect these distributions to have? Why? Do the shapes of the distributions meet your expectations?

You are free to use either R or SAS to answer each question.

For all questions, provide the code you used as well as any output asked for and clear, thorough explanations where necessary. Do not provide output that was not requested in the question.