

STAT 480, Homework 9, Spring 2003

Since there are only a limited number of computers in Snedecor 307 with Minitab on them, this will be a group project. Work in groups of 2 or 3 and turn in only one assignment for your group.

1. **Data and the Central Limit Theorem.** Consider the time (minutes) spent waiting for a bus. What does the distributions of waiting time and the sampling distributions of the sample mean, \bar{X} look like for sample sizes of 5 and 25?
 - Under the **Calc** pull down, choose **Random data** and **Exponential**
 - Generate **1000** rows of data and store in columns **C1-C5** with mean **4.0**. This generates 1000 samples of 5 waiting times.
 - Go to **Calc** and choose **Row statistics**. Click on the circle to the left of **Mean**.
 - In the **Input variables** box enter **C1-C5** and store the result in **C6**. The values in column C6 are the sample means for the 1000 samples.
 - Construct an appropriately titled histogram of C1 to display the simulated distribution of individual waiting times. Change the X axis label to “Waiting Time” and make other adjustments so that the histogram has a green fill and 20 intervals.
 - Construct an appropriately titled histogram of C6 to display the simulated sampling distribution of the sample mean waiting times for samples of 5. Change the X axis label to “Mean Waiting Time” and make other adjustments so that the histogram has a green fill and 20 intervals.

Repeat the process for a sample size of 25. That is, generate 1000 rows of data, store in columns C1-C25, find the mean and store in C26, construct an appropriately titled and labeled histogram of C26.

2. Write a GMACRO program for Minitab that will generate from an exponential distribution with mean 4 the 1000 rows in 5 columns and create the two histograms; one of 1000 individual values and one of 1000 sample means. Turn in a copy of the Macro and the two histograms.
3. Write a MACRO program for Minitab that will generate from an exponential distribution with any mean, any number of rows in up to 25 columns and create the two histograms; one of individual values and one of sample means. Turn in a copy of the Macro and the histograms for 1500 simulations of size 20. You will have to initialize enough columns with an Mcolumn statement to accommodate up to samples of size 25. You will also have to have an Mcolumn for the sample mean.
4. Extra credit: Figure out how to get the histograms to print the number of simulations, the sample size and value of the mean you enter for your simulation.