# Assignment 4

**Part 1:** Based on Handout 4 R, use R (as needed) to answer the following questions. Make sure you include clear headings (e.g., Handout 4 R or Handout 4 SAS). For each part of the question, make sure you include the command line/code, then paste relevant output/results, and also comment on the output/results as needed (to answer the questions).

1. Take a random sample of size 50 from `price`. Using this sample, what is your best point estimate of the population mean?
2. Since you have access to the population, simulate the sampling distribution for $\bar{x}_{price}$ by taking 2000 samples from the population of size 50 and computing 2000 sample means. Store these means in a vector called `sample_means50`. Plot the data, then describe the shape of this sampling distribution. Based on this sampling distribution, what would you guess the mean home price of the population to be? Finally, calculate and report the population mean.
3. Change your sample size from 50 to 150, then compute the sampling distribution using the same method as above, and store these means in a new vector called `sample_means150`. Describe the shape of this sampling distribution, and compare it to the sampling distribution for a sample size of 50. Based on this sampling distribution, what would you guess to be the mean sale price of homes in Ames?
4. Of the sampling distributions from 2 and 3, which has a smaller spread? If we're concerned with making estimates that are more often close to the true value, would we prefer a sampling distribution with a large or small spread?

**Part 2:** Based on Handout 4 SAS, apply SAS to answer the above questions. Make sure you include clear headings (e.g., Handout 4 R or Handout 4 SAS). For each part of the question, make sure you include the command line/code, then paste relevant output/results, and also comment on the output/results as needed (to answer the questions).

**Part 3:** Save your file as ***DA460_Assignment4_XXXXX.docx (or .pdf)*** where ***XXXXX*** is the first five letters of your last name, and submit it online.