

Economics 520, Homework 4

Due Thursday, September 21

The following questions should be done using either Matlab or Octave. You can start by trying things out in “interactive” mode, but write a batch file to answer all the questions, and provide a printout of the batch file and an edited printout of the results after running the batch file. (If you also write separate function files to help answer the question, include those as well.)

The batch file should include extensive comments explaining what the program is doing, and you should pick variable names carefully to make it easy to understand their roles. In addition, provide a concise discussion of what the programs are doing, the reasoning behind your calculations, and the numerical results.

1. Generate 1000 draws from a $N(0, 1)$ distribution, using the `randn` function. (Do not print out all 1000 draws, but keep them stored in a single vector variable for the next two questions). Find the approximate probability that a $N(0, 1)$ random variable is greater than 1, based on your 1000 draws.
2. Using the 1000 draws from the previous question, generate 1000 draws from a $N(1, 2)$ random variable. (Do not generate new random draws.) Find the approximate probability that a $N(1, 2)$ random variable is greater than 1.5.
3. Using the same 1000 draws as before, generate 1000 draws for $Y = X^2$, where X has a standard normal distribution. What is the support of this distribution? What is the approximate mean of the distribution of Y , and the approximate variance of Y , and the approximate probability that Y is greater than 2?
4. CB Question 3.5. Write a Matlab/Octave program to evaluate the probability indicated in the parenthetical remarks.