EE 511 Simulation Methods for Stochastic Systems

Project #1: Sampling and Waiting

[Adding Coins…]
Three distributions based on Bernoulli trials.
- Write a routine to simulate a fair Bernoulli trial in your language of choice. Generate a histogram for 100 simulated Bernoulli trials.
- Write a routine to count the number of successes in 5 fair Bernoulli trials. Generate a histogram for 100 samples of this counting random variable.
- Write a routine to count the number of trials before the first successful Bernoulli trial. Generate a histogram for 100 samples of this counting random.

Identify and compare the distributions in each of the simulations above.

[Coin Limits]
Take your Bernoulli success counting routine. Generate and sum k=2 samples from this routine. Generate 300 such sums and histogram your results. Repeat for k={5, 10, 30, 50}. Compare your histograms to a bell curve. How do you justify your observations?

[Bootstrap]
Download the NJGAS data set from Blackboard and find the 95% bootstrap confidence interval for the mean of the data set.

Turn in:
- A summary of your experiments including plots and statistics
- a brief discussion of the results (max 1 page per problem)
- a print out of your code.