Homework 4 (due Jun 07)

1. Perform a simulation study of a single server queue using the event-driven approach seen in class and described in [Law]. Write your code so that the interarrival and service times can have any non-negative value, discrete or continuous. As a test, use the program for AT LEAST ONE of the following two cases:
   a) P[1 arrival]=1-P[0 arrivals]=0.5, P[1 departure]=1-P[0 departures]=b (assume that arrivals cannot leave in the same slot they arrive). (i) Plot delay vs. rho by varying b from 0.5 to 1; (ii) plot a realization of queue size vs time for 10000 slots for b=1/3, 1/2, 2/3; compare with the same results of HW3.
   b) Poisson arrivals with rate lambda and service time one or two time units with the same probability. Plot delay vs. rho.
   c) (optional) derive the analytical results from queueing theory and compare
2. For one of the examples seen in class, compare the results of the simulations made using the raw estimator with those obtained using one of the variance reduction techniques