Digital Systems Simulation
Homework 1

Due September 2, 2003

1. An Iowa City bank wishes to develop a simulation model to test the efficiency of its teller scheduling policy. The bank has three service windows for deposits and withdrawals, and three service desks for more complex transactions. A secretary at the front entrance directs customers either to the service windows or to the desk area. Customers going to the service window enter a line, while customers going to the service desks wait in a common lobby area. As the modeler for this project, you must make some initial critical decisions about this system:

    1. Discuss possible objectives and performance measures for this model
    2. What is the environment of the bank?
    3. What are the entities in this model? Name some attributes of each entity type which might be important in this study.
    4. What are the events? Give a brief description of each.
    5. Identify the system resources, and possible state variables

2. For the sake of simplicity, let's assume that the bank has only one teller. Customers arrive, wait for service by the teller if the teller is busy, are served, and then depart the system. Manually simulate this system for 40 minutes to determine:
    a. Percent of time the teller is idle
    b. Average time a customer spends at the bank
    c. Average number of customers in the bank in 40 minutes.

Customer Number	Arrival Time (Min.)	Service Time (Min.)
1	3.2	3.8
2	10.9	3.5
3	13.2	4.2
4	14.8	3.1
5	17.7	2.4
6	19.8	4.3
7	21.5	2.7
8	26.3	2.1
9	32.1	2.5
10	36.6	3.4