CSC 354S
SYSTEMS MODELLING AND DISCRETE SIMULATION

SPRING 1997
UNIVERSITY OF TORONTO

PROBLEM SET 1

Purpose: To see if the “sim” in CSIM means “simple”.

General Comments: A signed pledge from each individual should be submitted to the course instructor well in advance of the handin for this problem set.

Specific Comments: The electronic submission for this problem set must be done by 2:00 p.m. on Thursday, February 13. The hard-copy handin for this problem set is due by in tutorial on Thursday, February 13. Hand in hard-copy answers in some secure package; specific handin requirements may be posted on the newsgroup. Remember to hand in a signed equality sheet with your hard-copy.

For ps1, do **not** worry about the niceties of good simulations, e.g., warming the system up, making multiple runs, doing variance reduction. Make 1 run and report your values.

1. Consider a terminal-driven computer system, with 24 terminals. The computer system has a uniformly distributed response time of 4 +/- 2 seconds. Upon receiving a system response, a user sitting at a terminal generates the next command after a uniformly distributed think time of 8 +/- 4 seconds. Write a CSIM program to determine a) the system throughput (the rate at which the computer system processes requests) and b) a reasonable view of the distribution of time in the computer system. Run the simulation for 500 submitted commands.

2. Question 6.6 from BCN.

3. Question 6.20 from BCN

4. Question 6.36 from BCN

5. Write a CSIM program to determine the goodness of the uniform random number generator in CSIM by applying the chi-square frequency test and the runs up and runs down test, for the (same) first 100 numbers.