Operating Systems Laboratory (CS39002)
Spring Semester 2017-2018

Assignment 2a

Implement producer / consumer mechanism using shared memory

Assignment given on: January 22, 2018
Assignment deadline: January 29, 2018

Implement a producer / consumer system using shared memory, with the following specifications:

a) The program will first read the values of NP (number of producers) and NC (number of consumers), and create the required number of producer and consumer processes.

b) Create a shared memory segment SHM, which is shared among all the producer and consumer processes. The shared memory segment will contain a buffer of finite size (say, can hold 5 integers).

c) Each producer process generates a random prime number, waits for a random interval of time between 0 and 5 seconds, and inserts the random number in the buffer. If the buffer is full, it waits until space becomes available. It will also print the number inserted along with the producer number and time (e.g. Producer 3: 37, time: ***).

d) Each consumer process waits for a random interval of time between 0 and 5 seconds, removes a number from the buffer, and prints it on the screen mentioning the consumer number and time (e.g. Consumer 2: 29, time: ***). If the buffer is empty, it waits until a number is inserted in the buffer.

e) The parent process will wait for a specified time (say, 30 seconds), and then kill all the producer and consumer processes.

Note: Checking for race condition and critical section problem are not required as part of this assignment.

Submission Guideline:

- Create a single program for the assignment, and name it **Ass2a_<groupno>.c** or **.cpp**, and upload it.
- You must show the running version of the program(s) to your assigned TA during lab hours.