

The LNM Institute of Information Technology
Operating Systems Lab (CSE223)
End-Term Examination (Lab) Odd Semester 2017-18

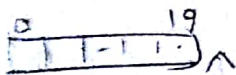
Day- I
Set-A

Note:- No internet connectivity/usage is permitted. Copy/cheating will get you straight a F grade!
Do not hard-code the possible outputs. You are not allowed to go out of the lab during exam.
Login with student/lnmit

Write a multi-threaded program to solve the m-producer n-consumer problem where, $m, n \geq 1$. You have a shared circular buffer that can hold 20 integers. Each of the producer processes stores the numbers 1 to 50 in the buffer one by one (in a for loop with 50 iterations) and then exits. Each of the consumer processes reads the numbers from the buffer and adds them to a shared variable SUM (initialized to 0). Any consumer process can read any of the numbers in the buffer. The only constraint is that every number written by some producer should be read exactly once by exactly one of the consumers. Of course, a producer should not write when the buffer is full and a consumer should not read when the buffer is empty.

The program then reads in the value of m and n from the user, and creates m producers and n consumers processes. The producer and consumer codes can be written as functions. The consumers exit after all the data produced by all the producers have been read. After all the producers and consumers have finished, the parent process prints the value of SUM.

Note that the value of SUM should be $m \times 25 \times 51$ if your program is correct.



50.51.25

$$\begin{array}{r} 25 \\ 51 \\ \hline 1275 \\ 2550 \\ \hline 3825 \end{array}$$

$$\begin{array}{r} 25 \\ 51 \\ \hline 1275 \\ 2550 \\ \hline 3825 \end{array}$$

$$\begin{array}{r} 25 \\ 51 \\ \hline 1275 \\ 2550 \\ \hline 3825 \end{array}$$

$$\begin{array}{r} 25 \\ 51 \\ \hline 1275 \\ 2550 \\ \hline 3825 \end{array}$$