

National University of Computer and Emerging Sciences



Laboratory Manual
for
Operating Systems Lab
(CL-220)

Course Instructor	Ms. Namra Absar
Lab Instructor(s)	Rasaal Ahmad
Section	5B
Semester	Fall 2023

Department of Computer Science
FAST-NU, Lahore, Pakistan

Objectives

- In this lab, students will practice thread synchronization using semaphores

Lab Questions

Question 1:

There are exactly 3 threads that generate string a, b, and c in an arbitrary order. In the absence of any synchronization mechanism, there will be no order in the generation of a, b, and c. Synchronize threads using semaphore in such a way that your printed string will be aaacbaaacbaaacb.....

<pre>//thread 1 While(1) { cout << 'a'; }</pre>	<pre>//thread 2 While(1) { Cout << 'b'; }</pre>	<pre>//thread 3 While(1) { Cout << 'c'; }</pre>
---	---	---

Question 2:

Two Threads i.e., Producer and Consumer are sharing a buffer of size 100. The producer generates a random number from 1 to 6, stores that number in the buffer, and prints the number. The consumer must read values from the buffer added by the producer, perform the summation operation, and display the result. The producer will stop after adding 100 values. Both producer and consumer threads run simultaneously; hence, synchronize.

You're not allowed to use cout/printf statements

The output should look Like

```
Number 2    //printed by producer.
Number 5
Number 4
Number 2
Number 6
Number 2
Number 5
```

Number 1
Number 4
Number 2
Number 3
Number 4
Number 3
Number 5
Sum 2 //printed by consumer.
Sum 7
Number 2
Sum 11
Sum 13