Dept. of CSE, IIITDM Kancheepuram

COM301P–Operating Systems
October 30, 2021

Lab Assignment –9

In this lab, you will write C programs to solve following solutions.

(1) Write a program to create five threads using pthread library. Find the sum of first 1000 numbers using five threads, where each thread can calculate sum of 200 numbers in each (parallel counting using threads).

(2) Write a program to create a thread. The thread prints numbers from 0 to n, where value of n is passed from the main process to the thread.

(3) Write a program to create a thread. The thread is created by passing an array which contains more than two integers as input from the main process. The two or more array elements will be added in the thread and will return the result to the main function. Finally, the main function will print the final sum.

(4) Implement the producer – consumer problem's solution using semaphore of pthread library. Use one producer and one consumer.

(5) Given 2 threads, schedule the order of execution in such a way that Thread A has to wait for Thread B and vice versa. In other words, given this code you want to guarantee that a1 happens before b2 and b1 happens before a2. Clearly mention the names and initial values of your semaphores.

Thread A	Thread B
1 statement a1	1 statement b1
2 statement a2	2 statement b2

Note: Your solution should not enforce too many constraints. For ex: there is no mention about the order of execution of a1 and b1. Therefore, either order should be possible.

Submission Instructions:

- Submit your assignment file in the Google classroom.

- After writing the code for each problem, write your own explanation in plain paper (Own Handwriting). Write your Name and Roll No in each page.

- Attach the screen short of the output after the execution of the program.

- Save all the above things of all the programs in to one file and save as RollNo_Lab#.pdf(Example: EC20B1001_Lab9.pdf) and upload.

- Make sure the program description(handwritten), program, output screenshot for all questions are included in a **single pdf** as mentioned above.

- Save all the C program files as per the format RollNo_Lab#_QuestionNo.c (Example: EC20B1001_Lab9_Q2.c) and upload.

- Any form of plagiarism/copying from peer or internet sources will lead penalty.
- NOTE: DO NOT ZIP THE FILES.