Operating Systems Laboratory

Master of Computer Application
Second Year, First Semester
Session: 2022-23

Assignment - V

Date: 24/04/2023

1. Write a C program which creates a child process. The parent and child process communicate using a shared memory segment. The parent process generates 100 random integers and writes it into the shared memory segment. The child process then computes the maximum, minimum and average of all these 100 numbers and writes the result back into the shared memory segment, from where the parent process reads the result and displays it. Add appropriate code to synchronize the parent and child process. [Hint: It is an example of strict alteration where access to the shared memory segment alternates between the parent and child process]

2. P_1, P_2 and P_3 are three processes executing their respective tasks. They should synchronize among themselves using semaphores such that the string "ABCCAB" gets printed 10 times. Write codes for process P_1, P_2 and P_3 to get the desired output. [Hint: Write code for the main process which creates and initializes necessary semaphores and then creates three child processes for executing tasks of process P_1, P_2 and P_3 respectively.]

```
P1
while(true){
    print("A");
}
```

```
P2
while(true){
    print("B");
}
```

```
P3
while(true){
    print("C");
}
```

3. Implement the solution to the producer-consumer problem using semaphores.

4. Implement the solution to the Reader-Writers problem using semaphores.