LAB #3 Report

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1. Simulation for 2 processes:

**Configuration:**

// # of Process

numprocess 2

// mean deivation

meandev 2000

// standard deviation

standdev 0

// process # I/O blocking

process 500

process 500

// duration of the simulation in milliseconds

runtime 10000

**Summary results:**

Scheduling Type: Batch (Nonpreemptive)

Scheduling Name: First-Come First-Served

Simulation Run Time: 4000

Mean: 2000

Standard Deviation: 0

Process # CPU Time IO Blocking CPU Completed CPU Blocked

0 2000 (ms) 500 (ms) 2000 (ms) 3 times

1 2000 (ms) 500 (ms) 2000 (ms) 3 times

**Summary processes:**

Process: 0 registered... (2000 500 0 0)

Process: 0 I/O blocked... (2000 500 500 500)

Process: 1 registered... (2000 500 0 0)

Process: 1 I/O blocked... (2000 500 500 500)

Process: 0 registered... (2000 500 500 500)

Process: 0 I/O blocked... (2000 500 1000 1000)

Process: 1 registered... (2000 500 500 500)

Process: 1 I/O blocked... (2000 500 1000 1000)

Process: 0 registered... (2000 500 1000 1000)

Process: 0 I/O blocked... (2000 500 1500 1500)

Process: 1 registered... (2000 500 1000 1000)

Process: 1 I/O blocked... (2000 500 1500 1500)

Process: 0 registered... (2000 500 1500 1500)

Process: 0 completed... (2000 500 2000 2000)

Process: 1 registered... (2000 500 1500 1500)

Process: 1 completed... (2000 500 2000 2000)

**Conclusion:**

While one process is being executed, the other process is blocked. They switch every

500 ms: the process is the middle of execution is blocked, while the one that was previously blocked runs. The simulation was run for 4000 ms because each process was run for

2000 ms. They were managed according to nonpreemptive scheduling (process B is only run after I/O Blockage of process A) The blockage in this case lasts 500 ms.

1. Simulation for 5 processes:

**Configuration:**

// # of Process

numprocess 5

// mean deivation

meandev 2000

// standard deviation

standdev 0

// process # I/O blocking

process 500

process 500

process 500

process 500

process 500

// duration of the simulation in milliseconds

runtime 10000

**Summary results:**

Scheduling Type: Batch (Nonpreemptive)

Scheduling Name: First-Come First-Served

Simulation Run Time: 10000

Mean: 2000

Standard Deviation: 0

Process # CPU Time IO Blocking CPU Completed CPU Blocked

0 2000 (ms) 500 (ms) 2000 (ms) 3 times

1 2000 (ms) 500 (ms) 2000 (ms) 3 times

2 2000 (ms) 500 (ms) 2000 (ms) 3 times

3 2000 (ms) 500 (ms) 2000 (ms) 3 times

4 2000 (ms) 500 (ms) 2000 (ms) 3 times

**Summary processes:**

Process: 0 registered... (2000 500 0 0)

Process: 0 I/O blocked... (2000 500 500 500)

Process: 1 registered... (2000 500 0 0)

Process: 1 I/O blocked... (2000 500 500 500)

Process: 0 registered... (2000 500 500 500)

Process: 0 I/O blocked... (2000 500 1000 1000)

Process: 1 registered... (2000 500 500 500)

Process: 1 I/O blocked... (2000 500 1000 1000)

Process: 0 registered... (2000 500 1000 1000)

Process: 0 I/O blocked... (2000 500 1500 1500)

Process: 1 registered... (2000 500 1000 1000)

Process: 1 I/O blocked... (2000 500 1500 1500)

Process: 0 registered... (2000 500 1500 1500)

Process: 0 completed... (2000 500 2000 2000)

Process: 1 registered... (2000 500 1500 1500)

Process: 1 completed... (2000 500 2000 2000)

Process: 2 registered... (2000 500 0 0)

Process: 2 I/O blocked... (2000 500 500 500)

Process: 3 registered... (2000 500 0 0)

Process: 3 I/O blocked... (2000 500 500 500)

Process: 2 registered... (2000 500 500 500)

Process: 2 I/O blocked... (2000 500 1000 1000)

Process: 3 registered... (2000 500 500 500)

Process: 3 I/O blocked... (2000 500 1000 1000)

Process: 2 registered... (2000 500 1000 1000)

Process: 2 I/O blocked... (2000 500 1500 1500)

Process: 3 registered... (2000 500 1000 1000)

Process: 3 I/O blocked... (2000 500 1500 1500)

Process: 2 registered... (2000 500 1500 1500)

Process: 2 completed... (2000 500 2000 2000)

Process: 3 registered... (2000 500 1500 1500)

Process: 3 completed... (2000 500 2000 2000)

Process: 4 registered... (2000 500 0 0)

Process: 4 I/O blocked... (2000 500 500 500)

Process: 4 registered... (2000 500 500 500)

Process: 4 I/O blocked... (2000 500 1000 1000)

Process: 4 registered... (2000 500 1000 1000)

Process: 4 I/O blocked... (2000 500 1500 1500)

Process: 4 registered... (2000 500 1500 1500)

**Conclusion:**

This time the execution took exactly the same amount of time the simulation was allocated (2000 \* 5 = 10000 ms). The processes were separated in pairs and handled the same way they were handled in the previous task. Namely, parts of the processes were executed sequentially for 500 ms, followed by a I/O blockage and active process switch, until they were completed. Every process was blocked 3 times in total. The 5th process does not have a pair, so it was executing and blocking itself, however that did not affect the execution time. The scheduling type is also batch nonpreemptive.

1. Simulation for 10 processes:

**Configuration:**

// # of Process

numprocess 10

// mean deivation

meandev 2000

// standard deviation

standdev 0

// process # I/O blocking

process 500

process 500

process 500

process 500

process 500

process 500

process 500

process 500

process 500

process 500

// duration of the simulation in milliseconds

runtime 10000

**Summary results:**

Scheduling Type: Batch (Nonpreemptive)

Scheduling Name: First-Come First-Served

Simulation Run Time: 10000

Mean: 2000

Standard Deviation: 0

Process # CPU Time IO Blocking CPU Completed CPU Blocked

0 2000 (ms) 500 (ms) 2000 (ms) 3 times

1 2000 (ms) 500 (ms) 2000 (ms) 3 times

2 2000 (ms) 500 (ms) 2000 (ms) 3 times

3 2000 (ms) 500 (ms) 2000 (ms) 3 times

4 2000 (ms) 500 (ms) 1000 (ms) 2 times

5 2000 (ms) 500 (ms) 1000 (ms) 1 times

6 2000 (ms) 500 (ms) 0 (ms) 0 times

7 2000 (ms) 500 (ms) 0 (ms) 0 times

8 2000 (ms) 500 (ms) 0 (ms) 0 times

9 2000 (ms) 500 (ms) 0 (ms) 0 times

**Summary processes:**

Process: 0 registered... (2000 500 0 0)

Process: 0 I/O blocked... (2000 500 500 500)

Process: 1 registered... (2000 500 0 0)

Process: 1 I/O blocked... (2000 500 500 500)

Process: 0 registered... (2000 500 500 500)

Process: 0 I/O blocked... (2000 500 1000 1000)

Process: 1 registered... (2000 500 500 500)

Process: 1 I/O blocked... (2000 500 1000 1000)

Process: 0 registered... (2000 500 1000 1000)

Process: 0 I/O blocked... (2000 500 1500 1500)

Process: 1 registered... (2000 500 1000 1000)

Process: 1 I/O blocked... (2000 500 1500 1500)

Process: 0 registered... (2000 500 1500 1500)

Process: 0 completed... (2000 500 2000 2000)

Process: 1 registered... (2000 500 1500 1500)

Process: 1 completed... (2000 500 2000 2000)

Process: 2 registered... (2000 500 0 0)

Process: 2 I/O blocked... (2000 500 500 500)

Process: 3 registered... (2000 500 0 0)

Process: 3 I/O blocked... (2000 500 500 500)

Process: 2 registered... (2000 500 500 500)

Process: 2 I/O blocked... (2000 500 1000 1000)

Process: 3 registered... (2000 500 500 500)

Process: 3 I/O blocked... (2000 500 1000 1000)

Process: 2 registered... (2000 500 1000 1000)

Process: 2 I/O blocked... (2000 500 1500 1500)

Process: 3 registered... (2000 500 1000 1000)

Process: 3 I/O blocked... (2000 500 1500 1500)

Process: 2 registered... (2000 500 1500 1500)

Process: 2 completed... (2000 500 2000 2000)

Process: 3 registered... (2000 500 1500 1500)

Process: 3 completed... (2000 500 2000 2000)

Process: 4 registered... (2000 500 0 0)

Process: 4 I/O blocked... (2000 500 500 500)

Process: 5 registered... (2000 500 0 0)

Process: 5 I/O blocked... (2000 500 500 500)

Process: 4 registered... (2000 500 500 500)

Process: 4 I/O blocked... (2000 500 1000 1000)

Process: 5 registered... (2000 500 500 500)

**Conclusion:**

10000 ms is not a sufficient amount of time to execute all 10 processes (their execution time is twice the amount of allocated simulation time). A way to fix it is either increase the simulation time or decrease the execution time of the processes. Up until the 5th process, the behavior was coincidental with the previous tasks. However, the simulation time ended half way through the execution of 5th and 6th process pair. They were still in progress, while the next processes did not even start.