

## EOPSY | Lab 3

### Task:

Create a configuration file in which all processes run an average of 2000 milliseconds with a standard deviation of zero, and which are blocked for input or output every 500 milliseconds. Run the simulation for 10000 milliseconds with 2 processes. Examine the two output files. Try again for 5 processes. Try again for 10 processes. Explain what's happening.

### Basic description:

Scheduling Type: Batch (No-preemptive) – in this type of scheduling, when CPU allocates resources to the given process, the process holds CPU till it get terminated or reach a waiting state. Non-preemptive scheduling does not interrupt a process until they are terminated or time is up. If a process with long burst time is running CPU, then later coming process with less CPU burst time may starve

Scheduling Name: First-Come First-Served – one of type of non-preemptive scheduling algorithm, it is a simple algorithm, which queues processes in the order that they arrive. The process that comes first will be execute first and next processes will be start after its execution. It is simple, however not very efficient.

### Simulation with 2 processes:

#### Configuration:

```
// # of Process
numprocess 2

// mean deviation
meandev 2000

// standard deviation
standdev 0

// process # I/O blocking
process 500
process 500

// duration of the simulation in milliseconds
runtime 10000
```

### 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)

```

### 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

Observation:

From the configuration, we have that whole simulation time has be less or equal to 10 000 [ms].  
 CPU time needed to complete the one processes is 2000 [ms]. Therefore, when we are have only  
 two processes, hence whole simulation time is 4000 [ms]. We can also observe the non-  
 preemptive scheduling structure in example:

```

Process: 1 registered... (2000 500 0 0)
Process: 1 I/O blocked... (2000 500 500 500)
Process: 1 registered... (2000 500 500 500)
Process: 1 I/O blocked... (2000 500 1000 1000)
Process: 1 registered... (2000 500 1000 1000)
Process: 1 I/O blocked... (2000 500 1500 1500)
Process: 1 registered... (2000 500 1500 1500)
Process: 1 completed... (2000 500 2000 2000)

```

### Simulation with 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-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)

#### 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

#### Observation:

First of all, we can observe that processes are executed in pairs [0&1, 2&3, 4]. From the result file, we should be able to say that 10 000 [ms] is enough to executed and terminated all 5 processes. However, we can observe, that in Summary-Processes process 4 is not completed.

#### Simulation with 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-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)

#### 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

#### Observation:

Similar to the case with 5 processes, we are unable to execute whole 10 processes. The first 4 processes are correctly terminated. Then, third pair was blocked by CPU three times. Moreover, the rest of processes weren't even registered.