

## CES-27 Distributed Processing

### 1th Activity

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## Task 1

It was implemented a Lamport's *Scalar Logic Clock* simulation. The implementation was made in Go and it can be seen on the Repository<sup>1</sup>.

### Suggested Test Case

As It was suggested, it was conducted a test with 3 terminal windows, on each one was opened one task of the program as shown in the Code 1.

The test was made according to the model represented on Figure 1. The results can be seen on the terminal windows shown from Figure 2 to Figure 4.

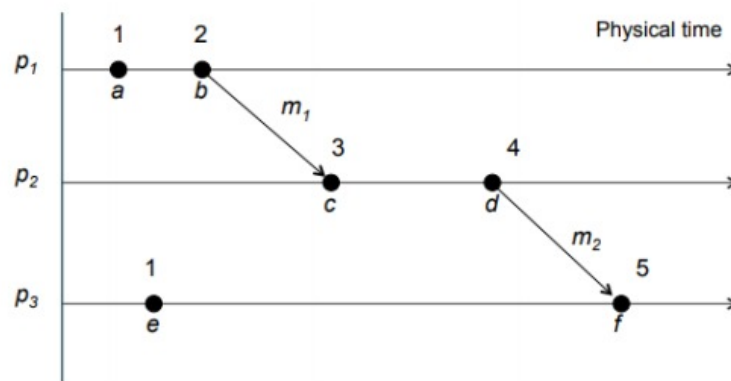


Figure 1: Model representing the execution of Task 1 example test case.

```
Terminal 1: go run Process.go 1 :10004 :10003 :10002
Terminal 2: go run Process.go 2 :10004 :10003 :10002
Terminal 3: go run Process.go 3 :10004 :10003 :10002
```

Code 1: Code that was run on each of the 3 terminal window on the execution of Task 1 example test case.

As expected, the logical clock on each process was updated to the bigger one, if the incoming message logical clock time was greater than the actual time on that process, and then it was also increased by one. This logic was applied and because of it the simulation on the terminals matched the model represented on Figure 1.

### Built Test Case

It was built a test case with 4 terminal windows, on each one was opened one task of the program as shown in the Code 2.

The test was made according to the model represented on Figure 1. The results can be seen on the terminal windows shown from Figure 6 to Figure 9.

<sup>1</sup><https://github.com/CarlosMatheus/CES-27/tree/master/lab01>



```
carlosmatheus@carlos-matheus-Virtual-Box: ~/Documents/CES-27-Labs/Lab01/task01$ go run Process.go 1 :10004 :10003 :10002
1
Destiny Id: 1
Current logical clock: 1
1
Destiny Id: 1
Current logical clock: 2
2
Destiny Id: 2
```

Figure 2: Window 1 after execution of Task 1 example test case.



```
carlosmatheus@carlos-matheus-Virtual-Box: ~/Documents/CES-27-Labs/Lab01/task01$ go run Process.go 2 :10004 :10003 :10002
2
Current logical clock: 3
2
Destiny Id: 2
Current logical clock: 4
3
Destiny Id: 3
```

Figure 3: Window 2 after execution of Task 1 example test case.

Terminal 1: go run Process.go 1 :10004 :10003 :10002 :10001  
Terminal 2: go run Process.go 2 :10004 :10003 :10002 :10001  
Terminal 3: go run Process.go 3 :10004 :10003 :10002 :10001  
Terminal 4: go run Process.go 4 :10004 :10003 :10002 :10001

Code 2: Code that was run on each of the 4 terminal window on the execution of Task 1 built test case.

As expected, the logical clock on each process was updated to the bigger one, if the incoming message logical clock time was greater than the actual time on that process, and then it was also increased by one. This logic was applied and because of it the simulation on the terminals matched the model represented on Figure 1.

```

carlosmatheus@carlos-matheus-VirtualBox: ~/Documents/CES-27-Labs/Lab01/task01$ go run Process.go 3 :10004 :10003 :10002
3
Destiny Id: 3
Current logical clock: 1
Current logical clock: 5
[]

```

Figure 4: Window 3 after execution of Task 1 example test case.

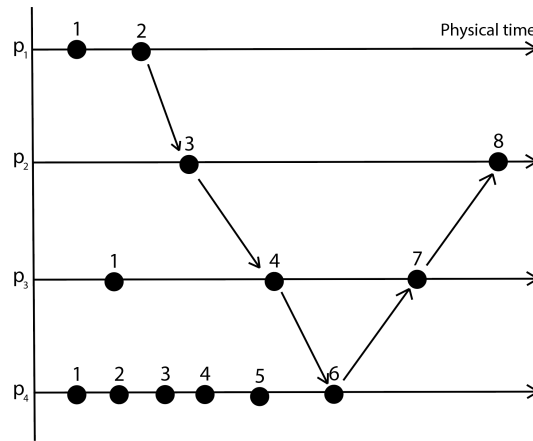


Figure 5: Model representing the execution of Task 1 built test case.

## Task 2

### Suggested Test Case

As It was suggested, it was conducted a test with 3 terminal windows, on each one was opened one task of the program as shown in the Code 3.

The test was made according to the model represented on Figure 10. The results can be seen on the terminal windows shown from Figure 11 to Figure 13.

```

Terminal 1: go run Process.go 1 :10004 :10003 :10002
Terminal 2: go run Process.go 2 :10004 :10003 :10002
Terminal 3: go run Process.go 3 :10004 :10003 :10002

```

Code 3: Code that was run on each of the 3 terminal window on the execution of Task 2 example test case.

As expected, the logical clock on each process was updated to the bigger one, if the incoming message logical clock time was greater than the actual time on that process, and then

A terminal window titled "VM2" with a "Default" theme. The prompt is "carlosmatheus@carlos-matheus-vm2: ~/Documents/CES-27-Labs/Lab01/task01\$". The command "go run Process.go 1 :10004 :10003 :10002 :10001" has been executed. The output shows three lines of data for "Destiny Id: 1": "Current logical clock: 1", "1", and "Destiny Id: 1". This is followed by two lines of data for "Destiny Id: 2": "Current logical clock: 2", "2", and "Destiny Id: 2".

```
carlosmatheus@carlos-matheus-vm2: ~/Documents/CES-27-Labs/Lab01/task01$ go run Process.go 1 :10004 :10003 :10002 :10001
1
Destiny Id: 1
Current logical clock: 1
1
Destiny Id: 1
Current logical clock: 2
2
Destiny Id: 2
```

Figure 6: Window 1 after execution of Task 1 built test case.

A terminal window titled "VM3" with a "Default" theme. The prompt is "carlosmatheus@carlos-matheus-vm3: ~/Documents/CES-27-Labs/Lab01/task01\$". The command "go run Process.go 2 :10004 :10003 :10002 :10001" has been executed. The output shows two lines of data for "Destiny Id: 3": "Current logical clock: 3" and "3".

```
carlosmatheus@carlos-matheus-vm3: ~/Documents/CES-27-Labs/Lab01/task01$ go run Process.go 2 :10004 :10003 :10002 :10001
Current logical clock: 3
3
Destiny Id: 3
Current logical clock: 8
```

Figure 7: Window 2 after execution of Task 1 built test case.

it was also increased by one. This logic was applied and because of it the simulation on the terminals matched the model represented on Figure 10.

```

carlosmatheus@carlos-matheus-VirtualBox: ~/Documents/CES-27-Labs/Lab01/task01$ go run Process.go 3 :10004 :10003 :10002 :10001
3
Destiny Id: 3
Current logical clock: 1
Current logical clock: 4
4
Destiny Id: 4
Current logical clock: 7
2
Destiny Id: 2
[]

```

Figure 8: Window 3 after execution of Task 1 built test case.

```

carlosmatheus@carlos-matheus-VirtualBox: ~/Documents/CES-27-Labs/Lab01/task01$ go run Process.go 4 :10004 :10003 :10002 :10001
4
Destiny Id: 4
Current logical clock: 1
4
Destiny Id: 4
Current logical clock: 2
4
Destiny Id: 4
Current logical clock: 3
4
Destiny Id: 4
Current logical clock: 4
4
Destiny Id: 4
Current logical clock: 5
Current logical clock: 6
3
Destiny Id: 3
[]

```

Figure 9: Window 4 after execution of Task 1 built test case.

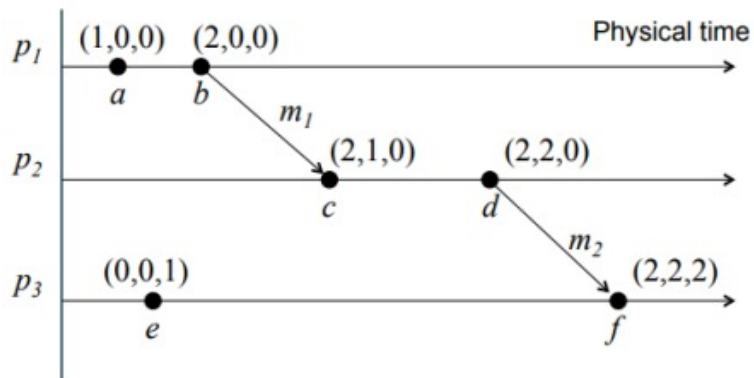


Figure 10: Model representing the execution of Task 1 example test case.

```
VM2
Default
carlosmatheus@carlosmatheus-vm2: ~/Documents/CES-27-Labs/Lab01/task02$ go run Process.go 1 :10004 :10003 :10002
1
Destiny Id: 1
Current logical Clocks: [1 0 0]
1
Destiny Id: 1
Current logical Clocks: [2 0 0]
2
Destiny Id: 2
█
```

Figure 11: Window 1 after execution of Task 2 example test case.

```
VM3
Default
carlosmatheus@carlosmatheus-vm3: ~/Documents/CES-27-Labs/Lab01/task02$ go run Process.go 2 :10004 :10003 :10002
Current logical Clocks: [2 1 0]
2
Destiny Id: 2
Current logical Clocks: [2 2 0]
3
Destiny Id: 3
█
```

Figure 12: Window 2 after execution of Task 2 example test case.

```
VM4
Default
carlosmatheus@carlosmatheus-vm4: ~/Documents/CES-27-Labs/Lab01/task02$ go run Process.go 3 :10004 :10003 :10002
3
Destiny Id: 3
Current logical Clocks: [0 0 1]
Current logical Clocks: [2 2 2]
█
```

Figure 13: Window 3 after execution of Task 2 example test case.