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Mohammad Yaseen 1220911

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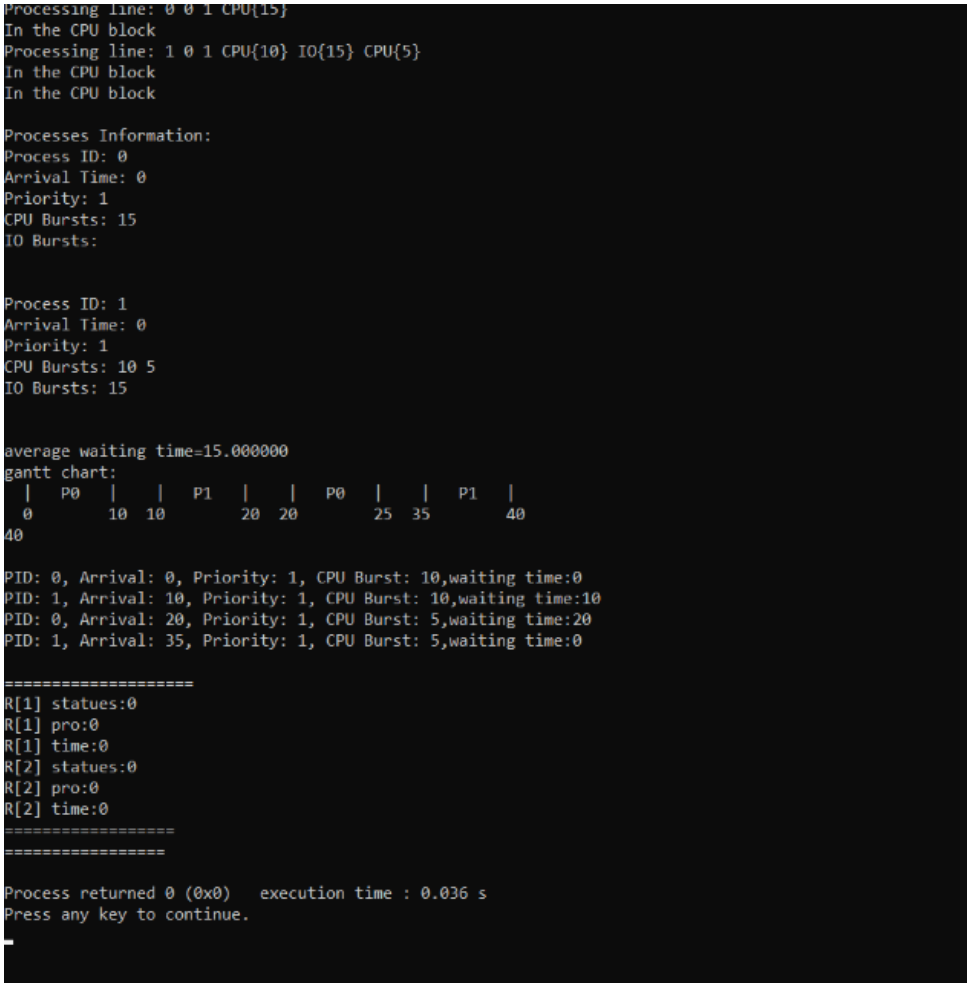
Test case 1 (without deadlock):

PID	Arrival Time	Priority	CPU / IO Bursts
0	0	1	CPU{15}
1	0	1	CPU{10} IO{15} CPU{5}

Gantt Chart

P0(0-10) P1(10-20) P0(20-25) (25-35)idel P1(35-40)

The output in consol :



Test case 2 (with deadlock):

Assume the time quantum q = 10, and a lower priority number implies a higher priority

PID	Arrival Time	Priority	CPU / IO Bursts
0	0	1	CPU{R[1], 10, R[2], 5, F[1], F[2]}
1	0	1	CPU{R[2], 8, R[1], 7, F[2], F[1]}
2	0	0	CPU{10}

Deadlocked processes: P0 and P1

Gantt Chart

P2(0-10) P1(10-18) [Deadlock occurs]:

```
IO Bursts:


there is an dead lock
there is an dead lock
average time=9.333333
gantt chart:
  |   P2   |    |   P1   |    |   P0   |    |   P1   |    |   P0   |
  0        10  10        18  18        28  28        35  35        40
40

PID: 2, Arrival: 0, Priority: 0, CPU Burst: 10,waiting time:0
PID: 1, Arrival: 10, Priority: 1, CPU Burst: 8,waiting time:10
PID: 0, Arrival: 18, Priority: 1, CPU Burst: 10,waiting time:18
PID: 1, Arrival: 28, Priority: 1, CPU Burst: 7,waiting time:0
PID: 0, Arrival: 35, Priority: 1, CPU Burst: 5,waiting time:0

====================
R[1] statues:1
R[1] pro:0
R[1] time:0
R[2] statues:0
R[2] pro:0
R[2] time:0
==================
==================

Process returned 0 (0x0)   execution time : 0.040 s
Press any key to continue.
```

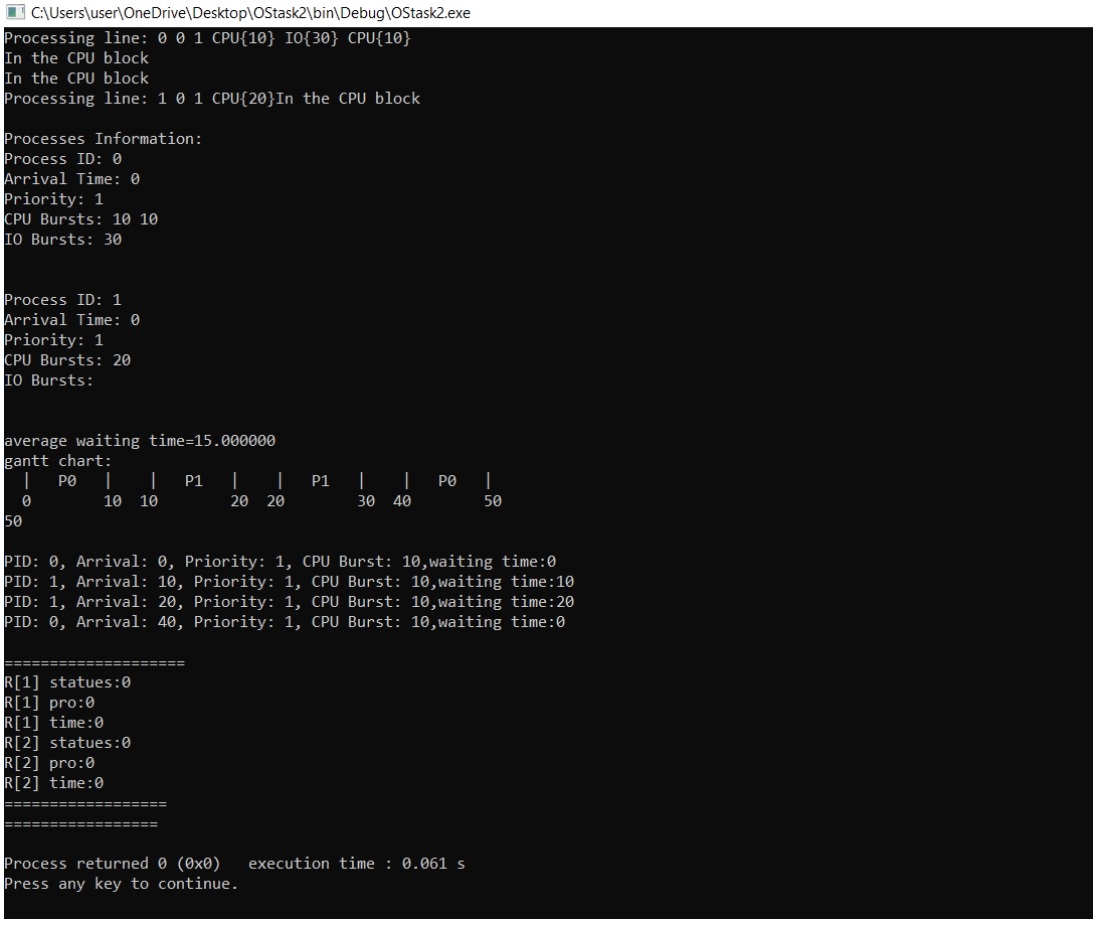
Test case 1 (without deadlock):

PID	Arrival Time	Priority	CPU / IO Bursts
0	0	0	CPU{10} IO{30} CPU{10}
1	0	0	CPU{20}

Gantt Chart

P0	P1	idle	P0

0 10 30 40
50



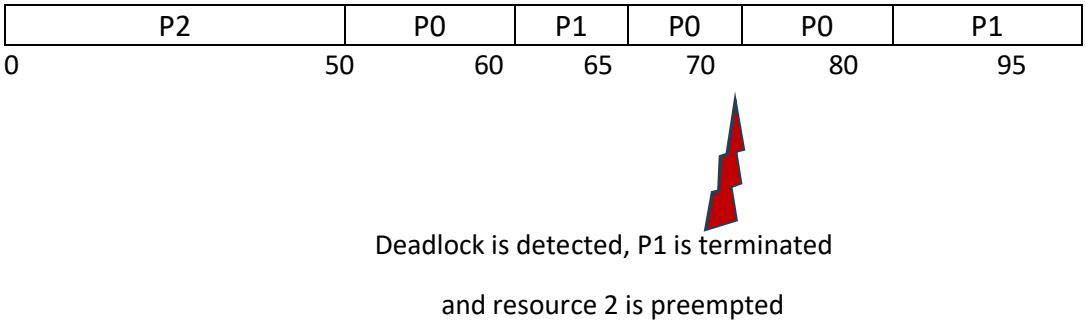
Test case 2 (with deadlock):

Assume the time quantum q = 10, and a lower priority number implies a higher priority

PID	Arrival Time	Priority	CPU / IO Bursts
0	0	1	CPU{R[1], 15, R[2], 10, F[1], F[2]}
1	0	1	CPU[5, R[2], R[1], 10, F[2], F[1]]
2	0	0	CPU{50}

Deadlocked processes: P0 and P1

Gantt Chart (**assuming that deadlock detection is applied whenever a resource is requested and deadlock recovery is achieved by terminating P1, i.e., P1 should run again from the beginning**)



```
there is an dead lock
there is an dead lock
average time=56.666667
gantt chart:
  |   P2   |    |   P1   |    |   P0   |    |   P0   |    |   P1   |    |   P0   |
  0        50  50        55  55        65  65        70  70        80  80        90
90

PID: 2, Arrival: 0, Priority: 0, CPU Burst: 50,waiting time:0
PID: 1, Arrival: 50, Priority: 1, CPU Burst: 5,waiting time:50
PID: 0, Arrival: 55, Priority: 1, CPU Burst: 10,waiting time:55
PID: 0, Arrival: 65, Priority: 1, CPU Burst: 5,waiting time:65
PID: 1, Arrival: 70, Priority: 1, CPU Burst: 10,waiting time:0
PID: 0, Arrival: 80, Priority: 1, CPU Burst: 10,waiting time:0

====================
R[1] statues:1
R[1] pro:0
R[1] time:0
R[2] statues:0
R[2] pro:0
R[2] time:0
==================
==================

Process returned 0 (0x0)   execution time : 0.025 s
Press any key to continue.
```