

Operating Systems

CPU Scheduler

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Section 1

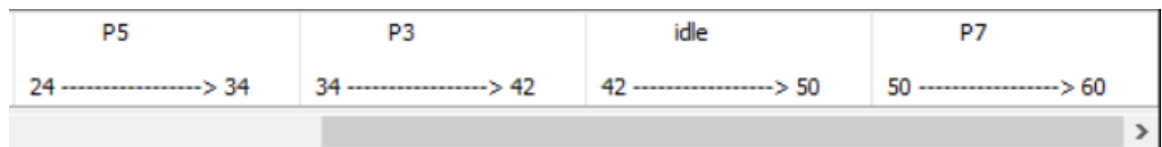
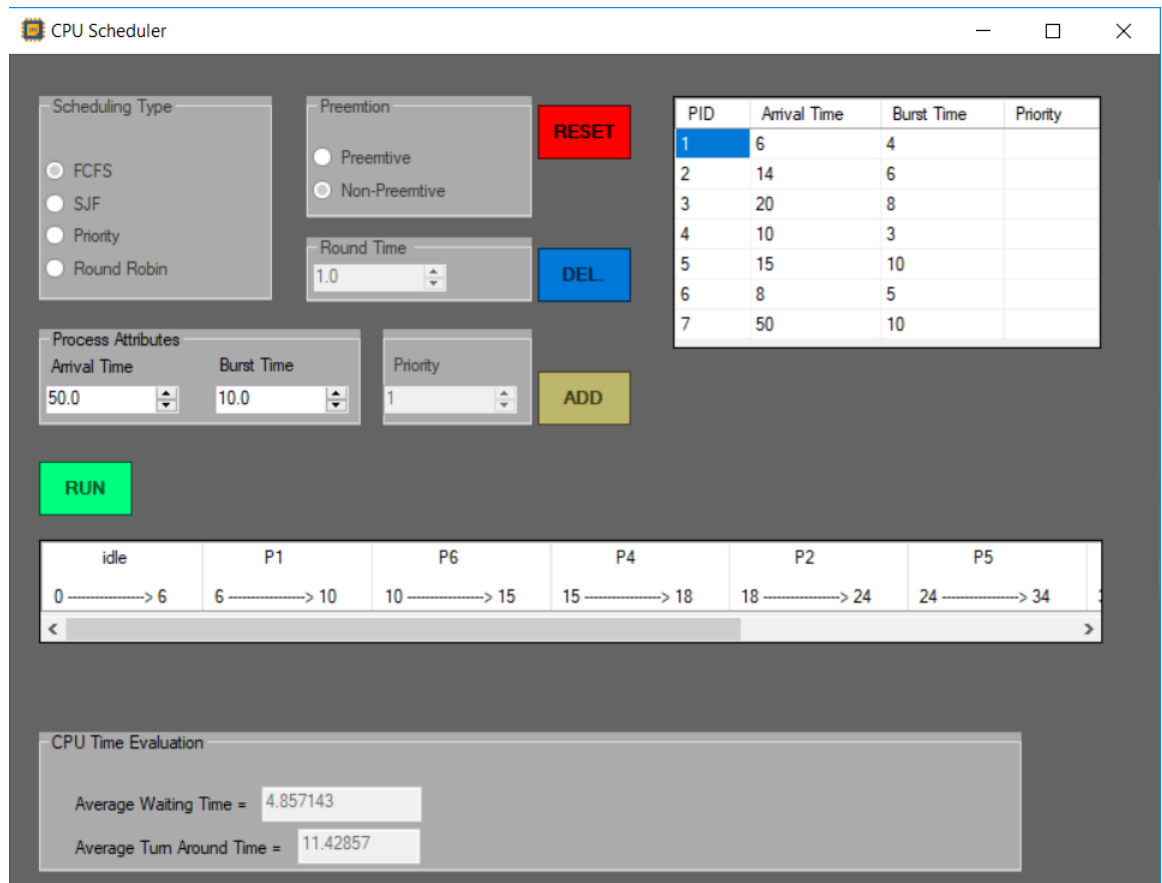
How to use the program:

- 1) Choose the desired Algorithm.
- 2) Choose the Preemption option (if required).
- 3) Enter the processes' Attributes.
- 4) Click ADD.
- 5) If mistaken Attributes was entered, just click "DEL" to remove it.
- 6) Hit "RESET" to remove all the Data entered
- 7) When entering the attributes is finished, just click "RUN" and wait for the Results :D .

("Just as simple as that 😊 ")

Test Cases:

1) First Come First Served



2) Shortest Job First (non-preemptive)

The screenshot shows the CPU Scheduler application window. The 'Scheduling Type' is set to 'SJF'. The 'Preemption' options are 'Preemptive' (selected) and 'Non-Preemptive'. The 'Round Time' is set to 1.0. The 'Process Attributes' section shows 'Arrival Time' as 16.0 and 'Burst Time' as 3.0. The 'Priority' is set to 1. The 'RUN' button is highlighted in green. The 'RESET' button is red, and the 'DEL' button is blue. The 'ADD' button is yellow.

PID	Arrival Time	Burst Time	Priority
1	0	4	
2	5	6	
3	10	8	
4	8	3	
5	15	10	
6	20	5	
7	16	3	

The Gantt chart shows the execution of processes P1, P2, P4, P3, and P7. The timeline is as follows:

- P1: 0 to 4
- idle: 4 to 5
- P2: 5 to 11
- P4: 11 to 14
- P3: 14 to 22
- P7: 22 to 25

The CPU Time Evaluation section shows the following results:

- Average Waiting Time = 4.714286
- Average Turn Around Time = 10.28571

P7	P6	P5
22 -----> 25	25 -----> 30	30 -----> 40

3) Priority (non-preemptive)

CPU Scheduler

Scheduling Type

- ☐ FCFS
- ☐ SJF
- ☒ Priority
- ☐ Round Robin

Preemption

- ☐ Preemptive
- ☒ Non-Preemptive

Round Time

1.0

RESET

DEL

Process Attributes

Arrival Time: 16.0

Burst Time: 3.0

Priority: 2

ADD

RUN

PID	Arrival Time	Burst Time	Priority
1	0	4	3
2	5	6	3
3	10	8	6
4	8	3	1
5	15	10	7
6	20	5	4
7	16	3	2

P1	idle	P2	P4	P3	P7
0 -----> 4	4 -----> 5	5 -----> 11	11 -----> 14	14 -----> 22	22 -----> 25

CPU Time Evaluation

Average Waiting Time = 4.714286

Average Turn Around Time = 10.28571

P7	P6	P5
22 -----> 25	25 -----> 30	30 -----> 40

4) Round Robin (Quantum=5)

CPU Scheduler

Scheduling Type

- ☐ FCFS
- ☐ SJF
- ☐ Priority
- ☒ Round Robin

Preemption

- ☐ Preemptive
- ☒ Non-Preemptive

Round Time

5.0

RESET

DEL

PID	Arrival Time	Burst Time	Priority
1	2	10	
2	3	3	
3	7	4	
4	13	5	
5	25	6	

Process Attributes

Arrival Time: 25.0, Burst Time: 6.0, Priority: 1

ADD

RUN

idle	P1	P2	P3	P1	P4	
0 —————> 2	2 —————> 7	7 —————> 10	10 —————> 14	14 —————> 19	19 —————> 24	24

CPU Time Evaluation

Average Waiting Time = 4

Average Turn Around Time = 9.6

P3	P1	P4	idle	P5	P5
10 —————> 14	14 —————> 19	19 —————> 24	24 —————> 25	25 —————> 30	30 —————> 31

5) Shortest Job First (preemptive)

CPU Scheduler

Scheduling Type

- ☒ FCFS
- ☐ SJF
- ☐ Priority
- ☐ Round Robin

Preemption

- ☐ Preemptive
- ☒ Non-Preemptive

Round Time

5.0

RESET

DEL

Process Attributes

Arrival Time: 25.0

Burst Time: 3.0

Priority: 2

ADD

RUN

PID	Arrival Time	Burst Time	Priority
1	0	10	
2	10	7	
3	14	8	
4	18	12	
5	20	20	
6	15	2	
7	25	3	

Timeline:

P1: 0 → 10

P2: 10 → 15

P6: 15 → 17

P2: 17 → 19

P3: 19 → 25

P7: 25 → 28

CPU Time Evaluation

Average Waiting Time = 6.285714

Average Turn Around Time = 15.14286

P7	P3	P4	P5
25 -----> 28	28 -----> 30	30 -----> 42	42 -----> 62

6) Priority (preemptive)

CPU Scheduler

Scheduling Type

- ☐ FCFS
- ☐ SJF
- ☒ Priority
- ☐ Round Robin

Preemption

- ☐ Preemptive
- ☐ Non-Preemptive

Round Time

5.0

Process Attributes

Arrival Time: 16.0, Burst Time: 3.0, Priority: 2

RESET **DEL** **ADD** **RUN**

PID	Arrival Time	Burst Time	Priority
1	0	4	3
2	5	6	3
3	10	8	6
4	8	3	1
5	15	10	7
6	20	5	4
7	16	3	2

Timeline:

P1	idle	P2	P4	P2	P3
0 → 4	4 → 5	5 → 8	8 → 11	11 → 14	14 → 16

CPU Time Evaluation

Average Waiting Time = 4.285714

Average Turn Around Time = 9.857142

P3	P7	P3	P6	P3	P5
14 → 16	16 → 19	19 → 20	20 → 25	25 → 30	30 → 40

That's it 😊