Operating Systems
Project 2 Report

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In this project we were expected to implement a CPU scheduling algorithm. I chose the Shortest Remaining Time First algorithm. This will include some explain about the code and sample outputs for given inputs. (input.txt should be in the same folder)

In this project I took the processes information from a .txt file and read it. First I counted the number of lines to get how many process are in the .txt file and created an array with the length of number of line. Then split every line with respect to ‘,’ . After split I initialized my array with respect of right indexes. In Shortest Remaining Time First I need to specify the smallest index for every time passes. There was two important condition first is the process which has the smallest burst time have to arrived and second is when a burst time reaches the 0, then I should not include it in to comparison. I write my if statement with the condition which I mentioned. And calculated the average turn around time , waiting time and response time for the given .txt file.

You can find the examples of running code below:

```
Ertugrul-iMac:OSProject2 ertugrulyilmaz$ gcc main.c
Ertugrul-iMac:OSProject2 ertugrulyilmaz$ ./a.out input.txt
```

Figure 1

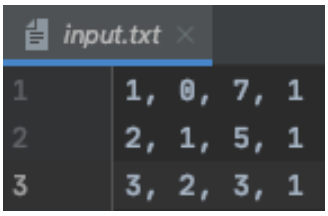

Figure 2

```
filename: input.txt
1, 0, 7, 1
2, 1, 5, 1
3, 2, 3, 1
Number of processes : 3

For process 1
1, 0, 7, 1

process_id : 1
arrival time : 0
burst time : 7
priority : 1

For process 2
2, 1, 5, 1

process_id : 2
arrival time : 1
burst time : 5
priority : 1

For process 3
3, 2, 3, 1
process_id : 3
arrival time : 2
burst time : 3
priority : 1
```

Figure 3

```
Time t=0, Process 1 is using the CPU
Time t=1, Process 1 is using the CPU
Time t=2, Process 2 is using the CPU
Time t=3, Process 3 is using the CPU
Time t=4, Process 3 is using the CPU
Time t=5, Process 3 is using the CPU
Process 3 finished at t=5
Time t=6, Process 2 is using the CPU
Time t=7, Process 2 is using the CPU
Time t=8, Process 2 is using the CPU
Time t=9, Process 2 is using the CPU
Process 2 finished at t=9
Time t=10, Process 1 is using the CPU
Time t=11, Process 1 is using the CPU
Time t=12, Process 1 is using the CPU
Time t=13, Process 1 is using the CPU
Time t=14, Process 1 is using the CPU
Time t=15, Process 1 is using the CPU
Process 1 finished at t=15

All processes are completed.

The average turnaround time: 8.67
The average waiting time: 3.67
The average response time: 1.00
```

Figure 4

input.txt

```
1, 0 ,8, 3
2, 1, 2, 4
3, 3, 4, 4
4, 4, 1, 5
5, 5, 6, 2
6, 6, 5, 6
7, 10, 1, 1
```

Figure 5

```
filename: input.txt
1, 0 ,8, 3
2, 1, 2, 4
3, 3, 4, 4
4, 4, 1, 5
5, 5, 6, 2
Number of processes : 5

For process 1
1, 0 ,8, 3

process_id : 1
arrival time : 0
burst time : 8
priority : 3

For process 2
2, 1, 2, 4

process_id : 2
arrival time : 1
burst time : 2
priority : 4

For process 3
3, 3, 4, 4

process_id : 3
arrival time : 3
burst time : 4
priority : 4

For process 4
4, 4, 1, 5

process_id : 4
arrival time : 4
burst time : 1
priority : 5

For process 5
5, 5, 6, 2
process_id : 5
arrival time : 5
burst time : 6
```

Figure 6

```
priority : 2

Time t=0, Process 1 is using the CPU
Time t=1, Process 1 is using the CPU
Time t=2, Process 2 is using the CPU
Time t=3, Process 2 is using the CPU
Process 2 finished at t=3
Time t=4, Process 3 is using the CPU
Time t=5, Process 4 is using the CPU
Process 4 finished at t=5
Time t=6, Process 3 is using the CPU
Time t=7, Process 3 is using the CPU
Time t=8, Process 3 is using the CPU
Process 3 finished at t=8
Time t=9, Process 5 is using the CPU
Time t=10, Process 5 is using the CPU
Time t=11, Process 5 is using the CPU
Time t=12, Process 5 is using the CPU
Time t=13, Process 5 is using the CPU
Time t=14, Process 5 is using the CPU
Process 5 finished at t=14
Time t=15, Process 1 is using the CPU
Time t=16, Process 1 is using the CPU
Time t=17, Process 1 is using the CPU
Time t=18, Process 1 is using the CPU
Time t=19, Process 1 is using the CPU
Time t=20, Process 1 is using the CPU
Time t=21, Process 1 is using the CPU
Process 1 finished at t=21

All processes are completed.

The average turnaround time: 7.60
The average waiting time: 3.40
The average response time: 1.60
```

Figure 7