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2K18/MC/114

Experiment 6

Aim: Write a program to implement Shortest Job First (Preemptive version).

Example:

Process	Arrival Time	Burst Time
P1	0	8
P2	1	4
P3	2	9
P4	3	5

Code:

```cpp
#include <bits/stdc++.h>
using namespace std;

struct Process{
    int pid;
    int bt;
    int at;
};

void waitingTime(Process proc[], int n, int wt[]){
    int rt[n];
    for (int i = 0; i < n; i++)  rt[i] = proc[i].bt;
    int complete = 0, t = 0, minm = INT_MAX;
    int least = 0, finish_time;
    bool check = false;
    while (complete != n){
        for(int j = 0; j < n; j++){
            if((proc[j].at <= t) && (rt[j] < minm) && rt[j] > 0){
                minm = rt[j];
                least = j;
                check = true;
            }
        }
```

```cpp
            if(check == false){
                t++;
                continue;
            }
            rt[least]--;
            minm = rt[least];
            if(minm == 0)  minm = INT_MAX;
            if(rt[least] == 0){
                complete++;
                check = false;
                finish_time = t + 1;
                wt[least] = finish_time - proc[least].bt - proc[least].at;
                if (wt[least] < 0)  wt[least] = 0;
            }t++;
        }
}

void turnAroundTime(Process proc[], int n, int wt[], int tat[]){
    for (int i = 0; i < n; i++)  tat[i] = proc[i].bt + wt[i];
}

void findavgTime(Process proc[], int n){
    int wt[n], tat[n], total_wt = 0, total_tat = 0;
    waitingTime(proc, n, wt);
    turnAroundTime(proc, n, wt, tat);
    cout<<" Process\t|"<<" Burst time\t|"<<" Waiting time\t|"<<" Turn
around time\n";
    for (int i = 0; i < n; i++) {
        total_wt = total_wt + wt[i];
        total_tat = total_tat + tat[i];
        cout<<"\t"<<proc[i].pid<<"\t|\t"<<proc[i].bt<<"\t|\t"<< wt[i]
<<"\t|\t"<<tat[i]<<"\n";
    }
    cout<<"\nAverage waiting time = "<<(float)total_wt / (float)n;
    cout<<"\nAverage turn around time = "<<(float)total_tat / (float)n
<<"\n";
}

int main(){
    int n;
    cout<<"Enter number of Processes: ";
    cin>>n;
    Process process[n];
    for(int i=0; i<n; i++){
        cout<<"Process "<<i+1<<"\n";
```

```cpp
        cout<<"Enter Process Id: ";
        cin>>process[i].pid;
        cout<<"Enter Arrival Time: ";
        cin>>process[i].at;
        cout<<"Enter Burst Time: ";
        cin>>process[i].bt;
        cout<<"\n";
    }
    findavgTime(process, n);
    return 0;
}
```



```
sidharth001@LAPTOP-2SFRN76F: /mnt/c/Users/Sidharth/os                      —    □    ×
sidharth001@LAPTOP-2SFRN76F:/mnt/c/Users/Sidharth$ cd os
sidharth001@LAPTOP-2SFRN76F:/mnt/c/Users/Sidharth/os$ g++ exp6.cpp && ./a.out
Enter number of Processes: 4
Process 1
Enter Process Id: 1
Enter Arrival Time: 0
Enter Burst Time: 8

Process 2
Enter Process Id: 2
Enter Arrival Time: 1
Enter Burst Time: 4

Process 3
Enter Process Id: 3
Enter Arrival Time: 2
Enter Burst Time: 9

Process 4
Enter Process Id: 4
Enter Arrival Time: 3
Enter Burst Time: 5

 Process        | Burst time    | Waiting time  | Turn around time
     1          |     8         |     9         |     17
     2          |     4         |     0         |     4
     3          |     9         |     15        |     24
     4          |     5         |     2         |     7

Average waiting time = 6.5
Average turn around time = 13
sidharth001@LAPTOP-2SFRN76F:/mnt/c/Users/Sidharth/os$
```