Q) Write a C program to execute FCFS, SJF and SRTF for process scheduling

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Write a C program to execute FCFS, SJF and SRTF for process scheduling

#

```
#include<stdio.h>
int at[20], cput[20];

void main(){
    int n, i, choice;
    printf("Enter the number of processes \n");
    scanf("%d", &n);
    printf("Enter the arrival time and cpu time for
  each process repectively \n");
    for(i=0; i<n; i++){
        scanf("%d %d", &at[i], &cput[i]);
    }
    printf("Menu\n\n1. FCFS \n2. SJF (Non preemptive)
    \n 3. SRTF (Preemptive)\n4. Exit \n");
    while(1){
        scanf("%d", &choice);
        switch(choice){
            case 1: fcfs(n);
                    break;
            case 2: sjf(n);
                    break;
            case 3: srtf(n);
                    break;
            case 4: exit(0);
            default: printf("Wrong choice \n");
        }
    }
}
```

```
void fcfs(int n){
    int cmpt[20], tat[10], wt[20], pname[25], temp;
    float awt=0, atat=0;
    int sum=0, i;
    for(i=0; i<n; i++){
        pname[i]=i;
    }
    for(i=0; i<n; i++){
        if(at[i]==at[i+1] && cput[i]>cput[i+1])
            temp = cput[i];
            cput[i] = cput[i+1];
            cput[i+1] = temp;
            temp = pname[i];
            pname[i] = pname[i+1];
            pname[i+1]=temp;
        }
    }
    for(i=0; i<n; i++){
        sum += cput[i];
        cmpt[i] = sum;
        tat[i] = cmpt[i] - at[i];
        wt[i] = tat[i] - cput[i];
    }
    for(i=0; i<n; i++){
        awt += wt[i];
        atat += tat[i];
    }
    awt = awt/n;
    atat = atat/n;
    printf("\t Process \tArrivaltime \tCPU time \t
    Waiting time \t Turnaroound time \n");
    for(i=0; i<n; i++){
        printf("\n\t P%d \t\t %d \t\t %d
    \t\t %d ", pname[i], at[i], cput[i], wt[i], tat[i]);
    }
```

```
    printf("\nAverage Waiting Time -- %f",awt);
    printf("\nAverage Turnaround Time -- %f",atat);
}

void sjf(int n){
    int cmpt[20],tat[20],wt[20],cput1[20];
    float awt=0, atat=0, sum_burst_time=0;
    int sum=0, i,j, smallest;
    for(i=0;i<n;i++){ cput1[i]=cput[i]
        sum_burst_time += cput[i];}
    printf("\t Process \tWaiting time \t Turnaround time\n");
    cput[9]=9999;
    while(sum<sum_burst_time){
        smallest=9;
        for(i=0; i<n; i++){
            if(at[i]<=sum && cput[i]>0 &&
            cput[i]<cput[smallest])
                smallest=i;
        }
    printf("\t P[%d] \t\t %d \t\t %d\n",
    smallest, sum+cput[smallest]-at[smallest],
    sum-at[smallest]);
    awt += sum+cput[smallest]-at[smallest];
    atat += sum-at[smallest];
    cput[smallest]=0;
    }
    awt=awt/n;
    atat=atat/n;
    printf("\nAverage Waiting time -- %f",awt);
    printf("\nAverage Turnaround time
            --%f\n",atat);
}
```

```
void srtf(int n){
    int remaining_time[20] tat[20] ,wt[20],
 completion_time[20], smallest, time, i,count=0;
    float awt=0, atat=0;
    for(i=0; i<n; i++)
        remaining_time[i]=cput[i];
    time=0;
    while(count!=n){
      smallest=-1;
      for(i=0; i<n; i++){
          if(at[i]<=time && remaining_time[i]>0)
    {
      if(smallest==-1 || remaining_time[i]<
          remaining_time[smallest])
            smallest=i;
    }
  }
  if(smallest==-1){
        time++;
        continue;
    }
  remaining_time[smallest]--;
  if(remaining_time[smallest]==0){
      count++;
      completion_time[smallest]=time+1;
    wt[smallest]=completion_time[smallest]-
        at[smallest]-cput(smallest);
    tat[smallest]=completion_time[smallest]-
            -at[smallest];
    }
    time++;
  }
```

```
for(i=0;i<n;i++){
    awt+=wt[i];
    atat+=tat[i];
}
awt = awt/n;
atat = atat/n;
printf("\nProcess\tArrival time\tCPU time\t
Waiting time\t Turnaround time\n");
for(i=0;i<n;i++){
    printf("%d\t %d\t\t %d\t\t %d\t\t %d\n",
    i, at[i], cput[i], wt[i], tat[i]);
}
printf("Average waiting time -- %f", awt);
printf("\n Average Turnaround time -- %f\n",
                                    atat);
}
```

Output:

```
Enter the number of processes
4
Enter arrival time and cpu time for each process
respectively
0  3
1  6
4  4
6  2
```

Menu

1. FCFS
2. STF (Non Preemptive)
3. SRTF (Preemptive)
4. Exit

1.

Process	Arrival time	Cpu time	Waiting time	Turnaround time
P0	0	3	0	3
P1	1	4	2	8
P2	4	6	5	9
P3	6	2	7	9

Average Waiting Time -- 3.50000
Average Turnaround Time -- 7.25000

2

Process	Waiting time	Turnaround time
P[0]	3	0
P[1]	8	2
P[3]	5	3
P[2]	11	7

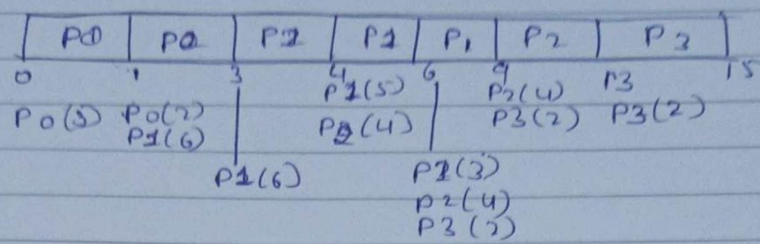
Average waiting time -- 6.75000
Averag Turnaround time -- 3.0000

3.

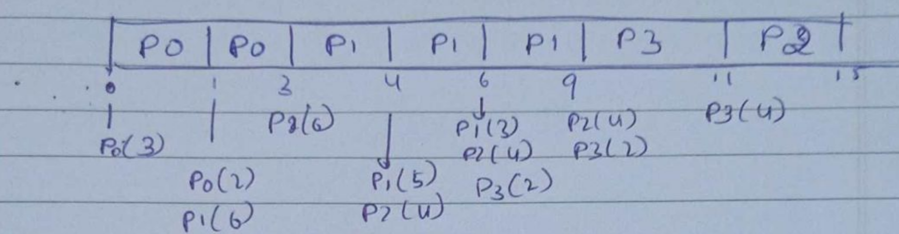
Process	Arrival Time	CPU Time	Waiting Time	Turnaround time
0	0	3	0	3
1	1	6	8	14
2	4	4	0	4
3	6	2	2	4

Average Waiting Time -- 2.50000
Average Turnaround Time -- 6.250000

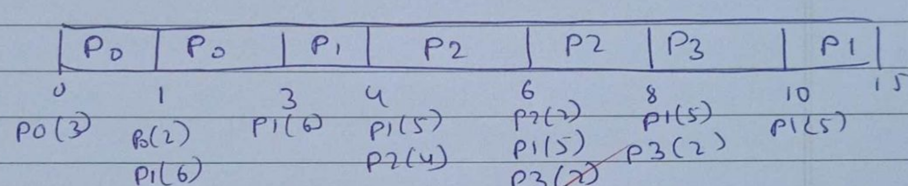
(1) FCFS



(2) SJF



(3) SRTF



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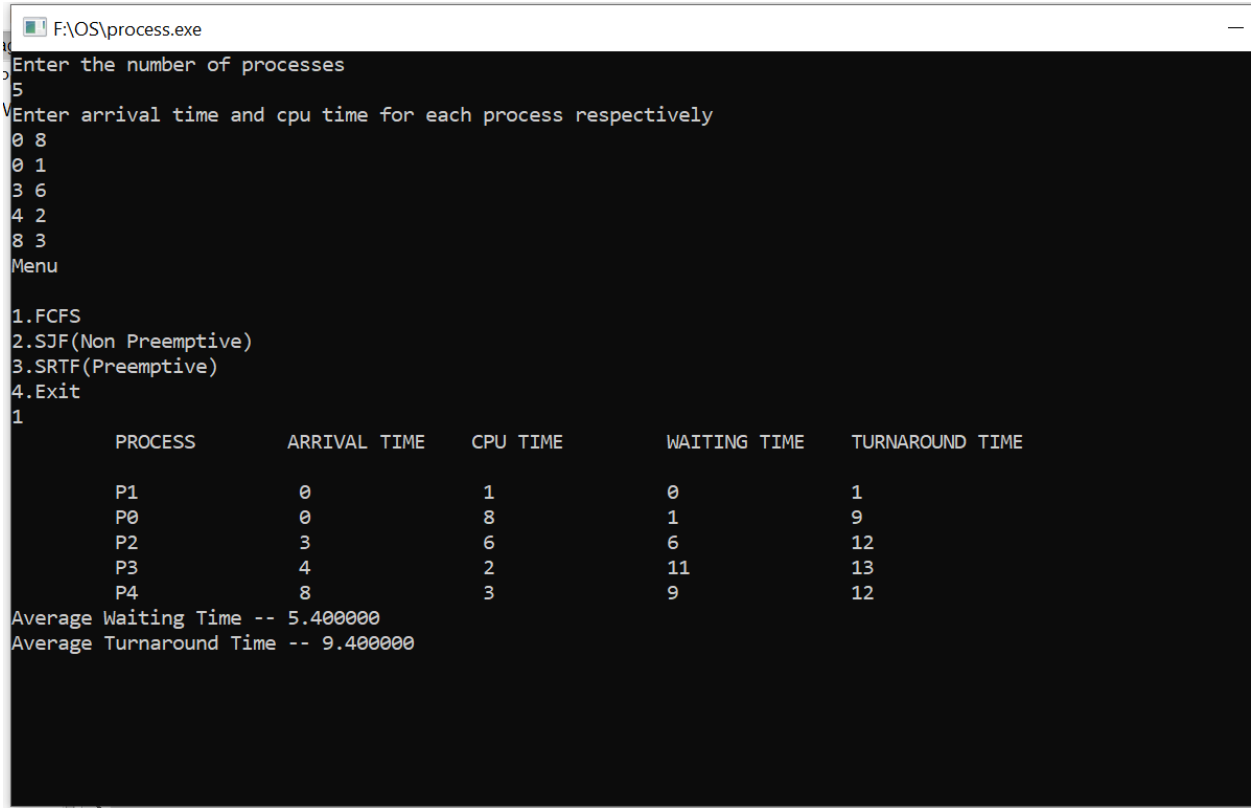
Output:

F:\OS\process.exe

```
Enter the number of processes
4
Enter arrival time and cpu time for each process respectively
0 3
1 6
4 4
6 2
Menu

1.FCFS
2.SJF(Non Preemptive)
3.SRTF(Preemptive)
4.Exit
1
        PROCESS        ARRIVAL TIME    CPU TIME         WAITING TIME    TURNAROUND TIME

        P0              0               3               0               3
        P1              1               6               2               8
        P2              4               4               5               9
        P3              6               2               7               9
Average Waiting Time -- 3.500000
Average Turnaround Time -- 7.250000

2
        PROCESS         WAITING TIME    TURNAROUND TIME
        P[0]            3               0
        P[1]            8               2
        P[3]            5               3
        P[2]            11              7

Average Waiting Time -- 6.750000
Average Turnaround Time -- 3.000000
3
```

F:\OS\process.exe

```
Average Waiting Time -- 6.750000
Average Turnaround Time -- 3.000000
3

Process Arrival Time    CPU Time        Waiting Time    Turnaround Time
0       0               3               0               3
1       1               6               8               14
2       4               4               0               4
3       6               2               2               4

Average Waiting Time -- 2.500000
Average Turnaround Time -- 6.250000
```


F:\OS\process.exe
Enter the number of processes
5
Enter arrival time and cpu time for each process respectively
0 8
0 1
3 6
4 2
8 3
Menu
1.FCFS
2.SJF(Non Preemptive)
3.SRTF(Preemptive)
4.Exit
1
PROCESS ARRIVAL TIME CPU TIME WAITING TIME TURNAROUND TIME
P1 0 1 0 1
P0 0 8 1 9
P2 3 6 6 12
P3 4 2 11 13
P4 8 3 9 12
Average Waiting Time -- 5.400000
Average Turnaround Time -- 9.400000