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3) Write a C program to simulate multi-level queue scheduling algorithm considering the following scenario, All the processes in the system are divided into two categories - System processes and User processes. System processes are to be given higher priority than user processes. Use FCFS scheduling for the processes in each queue.

```
#include <stdio.h>

void main()
{
    int p[20], bt[20], su[20], wt[20], tat[20],
    at[20], ct[20], i, k, n, temp;
    float wtavg, tatavg;
    printf("Enter the number of processes ---");
    scanf("%d", &n);
    for(i=0; i<n; i++)
    {
        p[i]=i;
        printf("Enter the Arrival time of process %d --",
        i);
        Scanf("%d", &at[i]);
        printf("Enter the Burst time of process
        %d ---", i);
        Scanf("%d", &bt[i]);
        printf("System/User Process (0/1) ? ---");
        scanf("%d", &su[i]);
    }
    for(i=0; i<n; i++){
        for(k= i+1; k<n; k++){
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```
if (at[i]<at[k] || (at[i] == at[k] &&
    su[i] > su[k])) {
        temp = p[i];
        p[i] = p[k];
        p[k] = temp;
        temp = bt[i];
        bt[i] = bt[k];
        bt[k] = temp;
        temp = su[i];
        su[i] = su[k];
        su[k] = temp;
        temp = at[i];
        at[i] = at[k];
        at[k] = temp;
    }
  }
}
wtavg = wt[0] = 0;
tatavg = tat[0] = bt[0];
ct[0] = at[0] + bt[0];
for(i=1; i<n; i++){
    if (ct[i-1] < at[i]){
        ct[i] = at[i] + bt[i];
    } else{
        ct[i] = ct[i-1] + bt[i];
    }
    wt[i] = ct[i] - at[i] - bt[i];
    tat[i] = ct[i] - at[i];
    wtavg += wt[i];
    tatavg += tat[i];
}
printf("\n Proc\t\t Arrival Time\t System/
        USER Proc\t Burst time\t waiting
```

```
time\t turnaround time");
for(i=0; i<n; i++){
    printf("\n %d \t\t\t %d \t\t\t %d \t\t\t %d \t\t\t %d",
        p[i], at[i], st[i], bt[i], wt[i], tat[i]);
}
printf("\n Average waiting time is ---- %f", wtavg/n);
printf("\n Average Turnaround Time is ---- %f", tatavg/n);
}
```

Output:

```
Enter the number of process --- 4
Enter the Arrival time of process 0 --- 0
Enter the Burst time of process 0 --- 2
System/ User process (0/1) ? --- 0
Enter the Arrival time of process 1 --- 0
Enter the Burst time of process 1 --- 1
System/ User process (0/1) ? --- 1
Enter the Arrival time of process 2 --- 0
Enter the Burst time of process 2 --- 5
System/ User process (0/1) ? --- 0
Enter the Arrival time of process 3 --- 0
Enter the Burst time of process 3 --- 3
System/ User process (0/1) ? --- 1
```

process	Arrival time	System/User process	Burst time	Waiting time	Turnaround time
0	0	0	2	0	2
2	0	0	5	2	7
1	0	1	1	7	8
3	0	1	3	8	11

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Average waiting Time is --- 4.250000
Average Turnaround Time is --- 7.000000

Sun
8/6/22.