# OPERATING SYSTEM

## LAB ASSESSMENT 2

BY: Sparsh Arya

REGISTRATION NUMBER:17BEC0656

SLOT: L7

```
#include<stdio.h>

#include<conio.h>

int main()

{

        int LL= 0;

        do{

                        printf("\nMenu for process scheduling:\n");

                        printf("\n----------------------------\n");

                        printf("1. FCFS\n");

                        printf("2. PRIORITY\n");

                        printf("3. SJF\n");

                        printf("4. ROUND ROBIN\n");

                        printf("5. PRE-EMPTIVE PRIORITY\n");

                        printf("6. SRTF\n");

                        printf("Enter choice:\n");

                        int choice;

                        scanf("%d",&choice);

                        int n; //The number of processes required in each scheduling algorithm

                        switch(choice){

                                case 1:{

                                        printf("FFCS scheduling algorithm is selected.\n");

                                        int i,j,bt[20],wt[20],tat[20],avwt=0,avtat=0;



                                        printf("Enter the number of processes :");

                                        scanf("%d",&n);

                                        printf("\nEnter the Process Burst Time\n");

                                        for(i=0;i<n;i++)

                                        {
```

```
    printf("P[%d]:",i+1);
    scanf("%d",&bt[i]);
}

wt[0]=0;

// Waiting time
for(i=1;i<n;i++)
{
    wt[i]=0;
    // Looping program
    for(j=0;j<i;j++)
        wt[i]+=bt[j];
}

printf("\nProcess\t\tBurst Time\tWaiting Time\tTurnaround Time");

//Turnaround time
for(i=0;i<n;i++)
{
    tat[i]=bt[i]+wt[i];
    avwt+=wt[i];
    avtat+=tat[i];

printf("\nP[%d]\t\t%d\t\t%d\t\t%d",i+1,bt[i],wt[i],tat[i]);
}

avwt/=i;
```

```
        avtat/=i;

        printf("\n\nAverage Waiting Time is:%d",avwt);

        printf("\nAverage Turnaround Time is:%d",avtat);

        break;

    }

    case 2:{

            printf("PRIORITY scheduling algorithm is selected.\n");

        int
        bt[20],p[20],wt[20],tat[20],pr[20],i,j,total=0,pos,temp,avg_wt,a
        vg_tat;


            printf("Enter the number of processes :");

            scanf("%d",&n);

            printf("\nEnter the Burst Time and Priority\n");

            for(i=0;i<n;i++)

            {

                printf("\nProcess no [%d]\n",i+1);

                printf("Burst Time:");

                scanf("%d",&bt[i]);

                printf("Priority:");

                scanf("%d",&pr[i]);

                p[i]=i+1;

            }


            for(i=0;i<n;i++)

            {

                pos=i;

                for(j=i+1;j<n;j++)

                {
```

```
        if(pr[j]<pr[pos])
            {
                pos = j;
                // Sorting priority
                temp=pr[i];
                pr[i]=pr[pos];
                pr[pos]=temp;

                // Sorting Burst time
                temp=bt[i];
                bt[i]=bt[pos];
                bt[pos]=temp;

                temp=p[i];
                p[i]=p[pos];
                p[pos]=temp;
            }
    }
}

total = 0;
//calculate waiting time
for(i=0;i<n;i++)
{
    wt[i]=total;
    total+=bt[i];
}

total = 0;
```

```
                        for(i=0;i<n;i++)
                        {
                            total+=wt[i];
                        }

                        avg_wt=(total)/n;      //average waiting time
                        total=0;

                        printf("\nProcess\t    Burst Time    \tWaiting Time\tTurnaround Time");
                        for(i=0;i<n;i++)
                        {
                            tat[i]=bt[i]+wt[i];     //calculate turnaround time
                            total+=tat[i];
                            printf("\nP[%d]\t\t  %d\t\t %d\t\t\t%d",p[i],bt[i],wt[i],tat[i]);
                        }

                        avg_tat=total/n;     //average turnaround time
                        printf("\n\nAverage Waiting Time=%d",avg_wt);
                        printf("\nAverage Turnaround Time=%d\n",avg_tat);
                        break;
                    }
                case 3:{
                    printf("You have chosen SJF scheduling algorithm!\n");
                    int bt[20],p[20],wt[20],tat[20],i,j,total=0,pos,temp;
                    float avg_wt,avg_tat;

                    printf("Enter the number of processes :");
```

```
scanf("%d",&n);

printf("\nEnter Burst Time:\n");
for(i=0;i<n;i++)
{
        printf("p%d:",i+1);
        scanf("%d",&bt[i]);
        p[i]=i+1;
}

for(i=0;i<n;i++)
{
        pos=i;
        for(j=i+1;j<n;j++)
        {
                if(bt[j]<bt[pos])
                {
                        pos=j;

                        temp=bt[i];
                        bt[i]=bt[pos];
                        bt[pos]=temp;

                        temp=p[i];
                        p[i]=p[pos];
                        p[pos]=temp;
                }
        }
}
```

```
wt[0]=0;

for(i=1;i<n;i++)
{
        wt[i]=0;

        // SUMMING UP PREVIOUS TIMES
        for(j=0;j<i;j++)
                wt[i]+=bt[j];

        total+=wt[i];
}

avg_wt=(float)total/n;
total=0;

printf("\nProcess\t    Burst Time    \tWaiting Time\tTurnaround Time");
for(i=0;i<n;i++)
{
        tat[i]=bt[i]+wt[i];
        total+=tat[i];
        printf("\np%d\t\t  %d\t\t %d\t\t\t%d",p[i],bt[i],wt[i],tat[i]);
}

avg_tat=(float)total/n;
```

```
                                 printf("\n\nAverage Waiting Time=%f\n",avg_wt);
                                 printf("\nAverage Turnaround Time=%f\n\n\n",avg_tat);
                                 break;
                          }
                          case 4:{
                                  printf("You have chosen ROUND ROBIN scheduling
algorithm!\n");
                                  printf("Enter the number of processes :");
                        scanf("%d",&n);

                                  int track,j,time,left,flag=0,tQuan;
                                  int wt=0,tat=0,at[10],bt[10],rt[10];
                                  left=n;
                                  for(track=0;track<n;track++)
                                  {
                                        printf("Arrival Time & Burst Time for Process Number
%d: \n",track+1);
                                        scanf("%d",&at[track]);
                                        scanf("%d",&bt[track]);
                                        rt[track]=bt[track];
                                  }

                                  printf("Enter Time Quantum:");
                                  scanf("%d",&tQuan);
                                  printf("\nProcess\tTurnaround Time\tWaiting Time\n\n");
                                  for(time=0,track=0;left!=0;)
                                  {
                                        if(rt[track]<=tQuan && rt[track]>0)
                                        {
```

```
          time+=rt[track];

          rt[track]=0;

          flag=1;

        }

        else if(rt[track]>0)

        {

          rt[track]-=tQuan;

          time+=tQuan;

        }

        if(rt[track]==0 && flag==1)

        {

          left--;

          printf("P[%d]\t\t%d\t\t%d\n",track+1,time-at[track],time-at[track]-bt[track]);

          wt+=time-at[track]-bt[track];

          tat+=time-at[track];

          flag=0;

        }

        if(track==n-1)

          track=0;

        else if(at[track+1]<=time)

          track++;

        else

          track=0;

    }

    printf("\nAverage Waiting Time= %f\n",wt*1.0/n);

    printf("Avg Turnaround Time = %f\n",tat*1.0/n);

    break;

}
```

```
                case 5:{
                    printf("You have chosen PRE-EMPTIVE PRIORITY scheduling algorithm!\n");
                    int bt[20],p[20],wt[20],tat[20],pr[20],i,j,total=0,pos,temp,avg_wt,avg_tat;

                    printf("Enter the number of processes :");
                    scanf("%d",&n);

                    printf("\nEnter Burst Time and Priority\n");
                    for(i=0;i<n;i++)
                    {
                        printf("\nP[%d]\n",i+1);
                        printf("Burst Time:");
                        scanf("%d",&bt[i]);
                        printf("Priority:");
                        scanf("%d",&pr[i]);
                        p[i]=i+1;
                    }

                    for(i=0;i<n;i++)
                    {
                        pos=i;
                        for(j=i+1;j<n;j++)
                        {
                            if(pr[j]<pr[pos])
                                pos=j;
                        }
```

```
Time");

        temp=pr[i];
        pr[i]=pr[pos];
        pr[pos]=temp;

        temp=bt[i];
        bt[i]=bt[pos];
        bt[pos]=temp;

        temp=p[i];
        p[i]=p[pos];
        p[pos]=temp;
    }

    wt[0]=0;

    for(i=1;i<n;i++)
    {
        wt[i]=0;
        for(j=0;j<i;j++)
            wt[i]+=bt[j];

        total+=wt[i];
    }

    avg_wt=total/n;
    total=0;

    printf("\nProcess\tBurst Time\tWaiting Time\tTurnaround
Time");
```

```
                for(i=0;i<n;i++)
                {
                    tat[i]=bt[i]+wt[i];
                    total+=tat[i];

printf("\nP[%d]\t\t%d\t\t%d\t\t\t%d",p[i],bt[i],wt[i],tat[i]);
                }

                avg_tat=total/n;
                printf("\n\nAverage Waiting Time=%d",avg_wt);
                printf("\nAverage Turnaround Time=%d\n",avg_tat);
                break;



            }
            case 6:{
                printf("You have chosen SRTF scheduling algorithm!\n");
                int at[10],bt[10],rt[10],endTime,i,smallest;
                int remain=0,time,sum_wait=0,sum_turnaround=0;
                printf("Enter the number of processes :");
                scanf("%d",&n);
                for(i=0;i<n;i++)
                {
                    printf("Enter arrival time for Process P%d : ",i+1);
                    scanf("%d",&at[i]);
                    printf("Enter burst time for Process P%d : ",i+1);
                    scanf("%d",&bt[i]);
                    rt[i]=bt[i];
                }
```

```
                    printf("\n\nProcess\t|Turnaround Time| Waiting Time\n\n");
                    rt[9]=9999;
                    for(time=0;remain!=n;time++)
                    {
                        smallest=9;
                        for(i=0;i<n;i++)
                        {
                            if(at[i]<=time && rt[i]<rt[smallest] && rt[i]>0)
                            {
                                smallest=i;
                            }
                        }
                        rt[smallest]--;
                        if(rt[smallest]==0)
                        {
                            remain++;
                            endTime=time+1;

    printf("\nP[%d]\t|\t%d\t|\t%d",smallest+1,endTime-at[smallest],endTime-bt[smallest]-
at[smallest]);
                            sum_wait+=endTime-bt[smallest]-at[smallest];
                            sum_turnaround+=endTime-at[smallest];
                        }
                    }
                    printf("\n\nAverage waiting time = %f\n",sum_wait*1.0/n);
                    printf("Average Turnaround time = %f",sum_turnaround*1.0/5);
                    break;
                }
                default: printf("You haven't chosen a valid choice!!");

                break;
            }

    }while(LL==0);
    return 0;
}
```