

### Question no. 12

#### Solution:-

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#include<stdio.h>

struct process
{
    char name;
    int AT,BT,WT,TAT,RT,CT;
}Q1[8],Q2[16],Q3[100];/*Three queues*/

int n;

void sortByArrival()
{
    struct process temp;
    int i,j;
    for(i=0;i<n;i++)
    {
        for(j=i+1;j<n;j++)
        {
            if(Q1[i].AT>Q1[j].AT)
            {
                temp=Q1[i];
                Q1[i]=Q1[j];
                Q1[j]=temp;
            }
        }
    }
}

int main()
{
    int i,j,k=0,r=0,time=0,tq1=8,tq2=16,flag=0;
    char c;
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printf("Enter no of processes:");

scanf("%d",&n);

for(i=0,c='A';i<n;i++,c++)
{
    Q1[i].name=c;

    printf("\nEnter the arrival time and burst time of process %c: ",Q1[i].name);

    scanf("%d%d",&Q1[i].AT,&Q1[i].BT);

    Q1[i].RT=Q1[i].BT;/*save burst time in remaining time for each process*/
}

sortByArrival();

time=Q1[0].AT;

printf("Process in first queue following RR with qt=8");

printf("\nProcess\t\tRT\t\tWT\t\tTAT\t\t");

for(i=0;i<n;i++)
{
    if(Q1[i].RT<=tq1)
    {
        time+=Q1[i].RT;/*from arrival time of first process to completion of this process*/

        Q1[i].RT=0;

        Q1[i].WT=time-Q1[i].AT-Q1[i].BT;/*amount of time process has been waiting in the first queue*/

        Q1[i].TAT=time-Q1[i].AT;/*amount of time to execute the process*/

        printf("\n%c\t\t%d\t\t%d\t\t%d",Q1[i].name,Q1[i].BT,Q1[i].WT,Q1[i].TAT);

    }

    else/*process moves to queue 2 with qt=8*/

    {

        Q2[k].WT=time;

        time+=tq1;

        Q1[i].RT-=tq1;

        Q2[k].BT=Q1[i].RT;

        Q2[k].RT=Q2[k].BT;

        Q2[k].name=Q1[i].name;
    }
}

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        k=k+1;

        flag=1;
    }
}

if(flag==1)

{printf("\nProcess in second queue following RR with qt=16");

    printf("\nProcess\t\tRT\t\tWT\t\tTAT\t\t");
    for(i=0;i<k;i++)

    {

        if(Q2[i].RT<=tq2)

        {

            time+=Q2[i].RT;/*from arrival time of first process +BT of this process*/

            Q2[i].RT=0;

            Q2[i].WT=time-tq1-Q2[i].BT;/*amount of time process has been waiting in the ready queue*/

            Q2[i].TAT=time-Q2[i].AT;/*amount of time to execute the process*/

            printf("\n%c\t\t%d\t\t%d\t\t%d",Q2[i].name,Q2[i].BT,Q2[i].WT,Q2[i].TAT);

        }

        else/*process moves to queue 3 with FCFS*/

        {

            Q3[r].AT=time;

            time+=tq2;

            Q2[i].RT-=tq2;

            Q3[r].BT=Q2[i].RT;

            Q3[r].RT=Q3[r].BT;

            Q3[r].name=Q2[i].name;

            r=r+1;

            flag=2;

        }

    }
}

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{if(flag==2)
printf("\nProcess in third queue following FCFS ");
}
for(i=0;i<r;i++)
{
    if(i==0)
        Q3[i].CT=Q3[i].BT+time-tq1-tq2;
    else
        Q3[i].CT=Q3[i-1].CT+Q3[i].BT;
}

for(i=0;i<r;i++)
{
    Q3[i].TAT=Q3[i].CT;
    Q3[i].WT=Q3[i].TAT-Q3[i].BT;
    printf("\n%c\t\t%d\t\t%d\t\t%d\t\t",Q3[i].name,Q3[i].BT,Q3[i].WT,Q3[i].TAT);

}

}

```