#include<iostream.h>

#include<conio.h>

#include<stdio.h>

class cpuschedule

{

int n,bu[20];

float twt,awt,wt[20],tat[20];

public:

void Getdata();

void fcfs();

void sjf();

void roundrobin();

};

//Getting no of processes and Burst time

void cpuschedule::Getdata()

{

int i;

cout<<“Enter the no of processes:”;

cin>>n;

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

{

cout<<“\nEnter The BurstTime for Process p”<<i<<“=”;

cin>>bu[i];

}

}

//First come First served Algorithm

void cpuschedule::fcfs()

{

int i,b[10];

float sum=0.0;

twt=0.0;

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

{

b[i]=bu[i];

cout<<“\nBurst time for process p”<<i<<“=”;

cout<<b[i];

}

wt[1]=0;

for(i=2;i<=n;i++)

{

wt[i]=b[i-1]+wt[i-1];

}

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

{

twt=twt+wt[i];

tat[i]=b[i]+wt[i];

sum+=tat[i];

}

awt=twt/n;

sum=sum/n;

cout<<“\nTotal Waiting Time=”<<twt;

cout<<“\nAverage Waiting Time=”<<awt;

cout<<“\nAverage Turnaround time=”<<sum;

}

//Shortest job First Algorithm

void cpuschedule::sjf()

{

int i,j,temp,b[10];

float sum=0.0;

twt=0.0;

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

{

b[i]=bu[i];

cout<<“\nBurst time for process p”<<i<<“=”;

cout<<b[i];

}

for(i=n;i>=1;i–)

{

for(j=2;j<=n;j++)

{

if(b[j-1]>b[j])

{

temp=b[j-1];

b[j-1]=b[j];

b[j]=temp;

}

}

}

wt[1]=0;

for(i=2;i<=n;i++)

{

wt[i]=b[i-1]+wt[i-1];

}

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

{

twt=twt+wt[i];

tat[i]=b[i]+wt[i];

sum+=tat[i];

}

awt=twt/n;

sum=sum/n;

cout<<“\nTotal Waiting Time=”<<twt;

cout<<“\nAverage Waiting Time=”<<awt;

cout<<“\nAverage turnaround time=”<<sum;

}

//Round Robin Algorithm

void cpuschedule::roundrobin()

{

int i,j,tq,k,b[10],Rrobin[10][10],count[10];

int max=0;

int m;

float sum=0.0;

twt=0.0;

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

{

b[i]=bu[i];

cout<<“\nBurst time for process p”<<i<<“=”;

cout<<b[i];

if(max<b[i])

max=b[i];

wt[i]=0;

}

cout<<“\nEnter the Time Quantum=”;

cin>>tq;

//TO find the dimension of the Round robin array

m=max/tq+1;

//initializing Round robin array

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

{

for(j=1;j<=m;j++)

{

Rrobin[i][j]=0;

}

}

//placing value in the Rrobin array

i=1;

while(i<=n)

{

j=1;

while(b[i]>0)

{

if(b[i]>=tq)

{

b[i]=b[i]-tq;

Rrobin[i][j]=tq;

j++;

}

else

{

Rrobin[i][j]=b[i];

b[i]=0;

j++;

}

}

count[i]=j-1;

i++;

}

cout<<“Display”;

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

{

for(j=1;j<=m;j++)

{

cout<<“\nRr[“<<i<<“,”<<j<<“]=”<<Rrobin[i][j];

cout<<”     “;

}

cout<<“\ncount=”<<count[i];

}

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

{

for(i=1;i<=count[j];i++)

{

if(i==count[j])

{

for(k=1;k<j;k++)

{

if(k!=j)

wt[j]+=Rrobin[k][i];

}

}

else

for(k=1;k<=n;k++)

{

if(k!=j)

wt[j]+=Rrobin[k][i];

}

}

}

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

cout<<“\nWaiting Time for process P”<<i<<“=”<<wt[i];

//calculating Average Weighting Time

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

{

twt=twt+wt[i];

tat[i]=b[i]+wt[i];

sum+=tat[i];

}

awt=twt/n;

sum=sum/n;

cout<<“\nTotal Waiting Time=”<<twt;

cout<<“\nAverage Waiting Time=”<<awt;

cout<<“\nAverage turnaround time=”<<sum;

}

void main()

{

int ch=0,cho;

cpuschedule c;

clrscr();

do

{

switch(ch)

{

case 0:

cout<<“\n0.MENU”;

cout<<“\n1.Getting BurstTime”;

cout<<“\n2.FirstComeFirstServed”;

cout<<“\n3.ShortestJobFirst”;

cout<<“\n4.RoundRobin”;

cout<<“\n5.EXIT”;

break;

case 1:

c.Getdata();

break;

case 2:

cout<<“FIRST COME FIRST SERVED SCHEDULING”;

c.fcfs();

break;

case 3:

cout<<“SHORTEST JOB FIRST SCHEDULING”;

c.sjf();

break;

case 4:

cout<<“ROUND ROBIN SCHEDULING”;

c.roundrobin();

break;

case 5:

break;

}

cout<<“\nEnter your choice:”;

cin>>ch;

getch();

}while(ch<5);

}