**CPU**

#include <iostream>

#include<cmath>

using namespace std;

void FCFS()

{

int no,i,bt[10],at[10],wt[10],tt[10],sum1=0,sum2=0,gc[10],awt,att;

cout<<"Enter the no of process to be schedule: ";

cin>>no;

for(i=0;i<no;i++)

{

cout<<"\nEnter the burst time for process p"<<i<<": ";

cin>>bt[i];

cout<<"\nEnter the arrival time for process p"<<i<<": ";

cin>>at[i];

}

cout<<"\n Gantt Chart ";

cout<<"\n-----------------";

cout<<endl;

for(i=0;i<no;i++)

{

cout<<"|p"<<i;

}

cout<<"|";

cout<<"\n------------------";

gc[0]=at[0];

cout<<endl;

cout<<gc[0];

for(i=1;i<=no;i++)

{

gc[i]=gc[i-1]+bt[i-1];

cout<<" "<<gc[i]<<" ";

}

cout<<"\n-------------------";

for(i=0;i<no;i++)

{

wt[i]=gc[i]-at[i];

tt[i]=gc[i+1]-at[i];

sum1=sum1+wt[i];

sum2=sum2+tt[i];

}

cout<<"\nProcess BurstTime Waiting Time Turn Around Time ";

for(i=0;i<no;i++)

{

cout<<"\np"<<i<<"\t\t"<<bt[i]<<"\t\t"<<wt[i]<<"\t\t"<<tt[i];

}

awt=sum1/no;

att=sum2/no;

cout<<"\nAverage Waiting Time: "<<awt;

cout<<"\nAverage Turn Arund Time: "<<att;

}

void SJF()

{

int n,bt[10],at[10],p[10],i,temp\_bt,temp\_id,temp\_at;

int st[10],ft[10],sum1=0,sum2=0,awt,att,wt[10],tt[10];

cout<<"\nEnter the no of process to be schedule: ";

cin>>n;

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

{

cout<<"Enter the process id: ";

cin>>p[i];

cout<<"\nEnter the burst time for process p"<<i<<": ";

cin>>bt[i];

cout<<"\nEnter the arrival time for process p"<<i<<": ";

cin>>at[i];

}

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

{

for(int j=0;j<n-1;j++)

{

if(bt[j+1]<bt[j])

{

temp\_bt=bt[j];

bt[j]=bt[j+1];

bt[j+1]=temp\_bt;

temp\_id=p[j];

p[j]=p[j+1];

p[j+1]=temp\_id;

temp\_at=at[j];

at[j]=at[j+1];

at[j+1]=temp\_at;

}

}

}

cout<<"\n Gantt Chart ";

cout<<"\n-----------------";

cout<<endl;

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

{

cout<<"|p"<<p[i];

}

cout<<"|";

cout<<"\n------------------";

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

{

if(i==0)

{

st[i]=0;

ft[i]=st[i]+bt[i];

}

else{

st[i]=st[i-1]+bt[i-1];

ft[i]=st[i]+bt[i];

}

}

cout<<endl;

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

{

cout<<st[i]<<" ";

if(i==n-1)

{

cout<<ft[i];

}

}

cout<<"\n--------------";

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

{

wt[i]=st[i]-at[i];

tt[i]=ft[i]-at[i];

sum1=sum1+wt[i];

sum2=sum2+tt[i];

}

cout<<"\nProcess BurstTime Waiting Time Turn Around Time ";

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

{

cout<<"\np"<<p[i]<<"\t\t"<<bt[i]<<"\t\t"<<wt[i]<<"\t\t"<<tt[i];

}

awt=sum1/n;

att=sum2/n;

cout<<"\nAverage Waiting Time: "<<awt;

cout<<"\nAverage Turn Arund Time: "<<att;

}

void Priority()

{

int n,bt[10],p[10],i,temp\_bt,temp\_id,temp\_at,temp\_pr,at=0;

int st[10],ft[10],sum1=0,sum2=0,awt,att,wt[10],tt[10],prio[10];

cout<<"\nEnter the no of process to be schedule: ";

cin>>n;

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

{

cout<<"Enter the process id: ";

cin>>p[i];

cout<<"\nEnter the burst time for process p"<<p[i]<<": ";

cin>>bt[i];

cout<<"\nEnter the priority for process p"<<p[i]<<": ";

cin>>prio[i];

}

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

{

for(int j=0;j<n-1;j++)

{

if(prio[j+1]<prio[j])

{

temp\_pr=prio[j];

prio[j]=prio[j+1];

prio[j+1]=temp\_pr;

temp\_bt=bt[j];

bt[j]=bt[j+1];

bt[j+1]=temp\_bt;

temp\_id=p[j];

p[j]=p[j+1];

p[j+1]=temp\_id;

}

}

}

cout<<"\n Gantt Chart ";

cout<<"\n-----------------";

cout<<endl;

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

{

cout<<"|p"<<p[i];

}

cout<<"|";

cout<<"\n------------------";

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

{

if(i==0)

{

st[i]=at;

ft[i]=st[i]+bt[i];

}

else{

st[i]=st[i-1]+bt[i-1];

ft[i]=st[i]+bt[i];

}

}

cout<<endl;

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

{

cout<<st[i]<<" ";

if(i==n-1)

{

cout<<ft[i];

}

}

cout<<"\n--------------";

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

{

wt[i]=st[i]-at;

tt[i]=ft[i]-at;

sum1=sum1+wt[i];

sum2=sum2+tt[i];

}

cout<<"\nProcess BurstTime Priority Waiting Time Turn Around Time ";

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

{

cout<<"\np"<<p[i]<<"\t\t"<<bt[i]<<"\t\t"<<prio[i]<<"\t\t"<<wt[i]<<"\t\t"<<tt[i];

}

awt=sum1/n;

att=sum2/n;

cout<<"\nAverage Waiting Time: "<<awt;

cout<<"\nAverage Turn Arund Time: "<<att;

}

int main()

{

int ch;

char ans;

do{

cout<<"\n-------Menu---------";

cout<<"\n1.FCFS ";

cout<<"\n2.SJF ";

cout<<"\n3.Priority";

cout<<"\nEnter your choice: ";

cin>>ch;

switch(ch)

{

case 1: FCFS();

break;

case 2: SJF();

break;

case 3: Priority();

break;

default:

break;

}

cout<<"\nDo you want to continue(y/n)";

cin>>ans;

}while(ans=='Y' || ans=='y');

return 0;

}









