#include<stdio.h>

#include<unistd.h>

int main(){

int n,i,j,a,b,c,x=0;

int temp=0;

printf("Enter number of processes\n");

scanf("%d",&n);

int q1[n],q2[n],q3[n];

int p[n],pro[n],bt[n],at[n],rt[n];

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

{

printf("\n\nEnter process name for process %d = ",i+1,"\n");

printf("P");

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

printf("\n\nEnter priority for this process ");

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

printf("\n\nEnter burst time for this process ");

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

}

for(i=0;i<n-1;i++) //O(n-1)

{

for(j=0;j<(n-i-1);j++) //O(n-i-1)

{

if(p[j]>p[j+1]){

temp=p[j];

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

p[j+1]=temp;

temp=pro[j];

pro[j]=pro[j+1];

pro[j+1]=temp;

temp=bt[j];

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

bt[j+1]=temp;

}}

}

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

{

printf("Process P%d",pro[i]);

printf(" with priority %d",p[i]);

printf(" has burst time %d",bt[i]);

printf("\n\n");

}

printf("\nEnter the number of processes you want to process in queue 1 :\n");

scanf("%d",&a);

printf("Enter the number of processes you want to process in queue 2 :\n");

scanf("%d",&b);

printf("Enter the number of processes you want to process in queue 3 :\n");

scanf("%d",&c);

for(i=0;i<a;i++){ //O(a)

q1[x]=p[i];

x=x+1;

}

printf("\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n");

printf("| QUEUE 1 Priority Burst time |\n");

printf("|\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_|\n");

for(i=0;i<a;i++){ //O(a)

printf(" P%d ",pro[i]);

printf("%d ",p[i]);

printf("%d\n",bt[i]);

}

printf("\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n\n");

for(i=a;i<b+a;i++){ //O(b)

q2[x]=p[i];

x=x+1;

}

printf("\n");

printf("\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n");

printf("| QUEUE 2 Priority Burst time |\n");

printf("|\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_|\n");

for(i=a;i<b+a;i++){ //O(b)

printf(" P%d ",pro[i]);

printf("%d ",p[i]);

printf("%d\n",bt[i]);

}

printf("\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n\n");

for(i=b+a;i<c+b+a;i++){ //O(c)

q3[x]=p[i];

x=x+1;

}

printf("\n");

printf("\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n");

printf("| QUEUE 3 Priority Burst time |\n");

printf("|\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_|\n");

for(i=b+a;i<c+a+b;i++){ //O(c)

printf(" P%d ",pro[i]);

printf("%d ",p[i]);

printf("%d\n",bt[i]);

}

printf("\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\n");

printf("\n");

int tq,t,remain,flag=0;

int waiting\_time=0,turn\_time=0;

remain=a;

printf("\n\nWELCOME TO QUEUE 1... LETS DO ROUND ROBIN SCHEDULING...\n\n");

for(i=0;i<a;i++){ //O(c)

printf("Enter arrival time for P%d =",pro[i]);

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

rt[i]=bt[i];

}

printf("Enter Time Quantum = ");

scanf("%d",&tq);

printf("\n\nProcess\t|Turnaround time|Waiting time\n\n");

for(t=0,i=0;remain!=0;) //O(a)

{

if(rt[i]<=tq && rt[i]>0)

{

t=t+rt[i];

rt[i]=0;

flag=1;

}

else if(rt[i]>0)

{

rt[i]=rt[i]-tq;

t=t+tq;

}

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

{

remain--;

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

waiting\_time=waiting\_time+t-at[i]-bt[i];

turn\_time=turn\_time+t-at[i];

flag=0;

}

if(i==a-1)

i=0;

else if(at[i+1]<=t)

i++;

else

i=0;

}

printf("\n\nAverage waiting time= %f sec\n",waiting\_time\*1.0/a);

printf("\nAverage turnaround time= %f sec\n",turn\_time\*1.0/a);

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

printf("\n\nWELCOME TO QUEUE 2... LETUS DO PRIORITY QUEUE SCHEDULING..\n");

int wtime[n],ttime[n];int avg\_wt,avg\_tat,total=0;

wtime[a]=0;

for(i=a+1;i<b+a;i++){ //O(b)

wtime[i]=0;

for(j=a;j<i;j++) //O(i-a)

wtime[i]=wtime[i]+bt[j];

total=total+wtime[i];

}

avg\_wt=total\*1.0/b;

total=0;

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

for(i=a;i<b+a;i++) //O(b)

{

ttime[i]=bt[i]+wtime[i];

total=total+ttime[i];

printf("\nP%d\t\t%d\t\t%d\t\t%d",i+1,bt[i],wtime[i],ttime[i]);

}

avg\_tat=total/b;

printf("\n\nAverage waiting time= %f sec\n",avg\_wt\*1.0);

printf("\nAverage turnaround time= %f sec\n",avg\_tat\*1.0);

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

printf("\n\nWelcome to QUEUE 3... let us do FCFS scheduling\n");

int wt[n],tat[n]; int avwt=0,avtat=0;

wt[b+a]=0;

for(i=b+a+1;i<c+a+b;i++){ //O(c)

wt[i]=0;

for(j=b+a;j<i;j++) //O(i-b-a)

wt[i]=wt[i]+bt[j];

}

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

for(i=b+a;i<b+a+c;i++) //O(c)

{

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

avwt=avwt+wt[i];

avtat=avtat+tat[i];

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

}

printf("\n\nAverage waiting time= %f sec\n",avwt\*1.0/c);

printf("\nAverage turnaround time= %f sec\n",avtat\*1.0/c);

}