#include<stdio.h>

#include<limits.h>

#include<stdbool.h>

struct P{

int AT,BT,ST[20],WT,FT,TAT,pos;

};

int quant;

int main(){

int n,i,j;

printf("Enter the no. of processes :");

scanf("%d",&n);

struct P p[n];

printf("Enter the quantum \n");

scanf("%d",&quant);

printf("Enter the process numbers \n");

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

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

printf("Enter the Arrival time of processes \n");

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

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

printf("Enter the Burst time of processes \n");

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

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

int c=n,s[n][20];

float time=0,mini=INT\_MAX,b[n],a[n];

int index=-1;

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

b[i]=p[i].BT;

a[i]=p[i].AT;

for(j=0;j<20;j++){

s[i][j]=-1;

}

}

int tot\_wt,tot\_tat;

tot\_wt=0;

tot\_tat=0;

bool flag=false;

while(c!=0){

mini=INT\_MAX;

flag=false;

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

float p=time+0.1;

if(a[i]<=p && mini>a[i] && b[i]>0){

index=i;

mini=a[i];

flag=true;

}

}

if(!flag){

time++;

continue;

}

j=0;

while(s[index][j]!=-1){

j++;

}

if(s[index][j]==-1){

s[index][j]=time;

p[index].ST[j]=time;

}

if(b[index]<=quant){

time+=b[index];

b[index]=0;

}

else{

time+=quant;

b[index]-=quant;

}

if(b[index]>0){

a[index]=time+0.1;

}

if(b[index]==0){

c--;

p[index].FT=time;

p[index].WT=p[index].FT-p[index].AT-p[index].BT;

tot\_wt+=p[index].WT;

p[index].TAT=p[index].BT+p[index].WT;

tot\_tat+=p[index].TAT;

}

}

printf("Process number ");

printf("Arrival time ");

printf("Burst time ");

printf("\tStart time");

j=0;

while(j!=10){

j+=1;

printf(" ");

}

printf("\t\tFinal time");

printf("\tWait Time ");

printf("\tTurnAround Time \n");

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

printf("%d \t\t",p[i].pos);

printf("%d \t\t",p[i].AT);

printf("%d \t",p[i].BT);

j=0;

int v=0;

while(s[i][j]!=-1){

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

j++;

v+=3;

}

while(v!=40){

printf(" ");

v+=1;

}

printf("%d \t\t",p[i].FT);

printf("%d \t\t",p[i].WT);

printf("%d \n",p[i].TAT);

}

double avg\_wt,avg\_tat;

avg\_wt=tot\_wt/(float)n;

avg\_tat=tot\_tat/(float)n;

printf("The average wait time is : %lf\n",avg\_wt);

printf("The average TurnAround time is : %lf\n",avg\_tat);

return 0;

}

