#include<iostream>

#include<cstring>

#define M 40

#define N 30

#define C 6

using namespace std;

struct Stu{

long stuid;

char stuname[N];

int stuscore[C];

double stusum;

double stuave;

};

void readstu(Stu stu[],int n,int m){

int k;

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

cout<<"请输入学号:";

cin>>stu[i].stuid;

cout<<"请输入姓名:";

cin>>stu[i].stuname; //若带空格则cin.getline()

cout<<"请输入成绩:";

for(k=0,stu[i].stusum=0;k<m;k++){

cin>>stu[i].stuscore[k];

stu[i].stusum += stu[i].stuscore[k];

}

stu[i].stuave = stu[i].stusum/m;

}

}

void printstu(Stu stu[],int n,int m )

{

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

cout<<stu[i].stuid<<"\t"<<stu[i].stuname<<"\t";

for(int k=0;k<m;k++){

cout<<stu[i].stuscore<<"\t";

}

cout<<stu[i].stusum<<"\t"<<stu[i].stuave<<endl;

}

}

void printe(Stu stu[],int n,int m){

int i;

double sum[m];

double ave[m];

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

sum[i]=0;

for(int j=0;j<n;j++){

sum[i]+=stu[j].stuscore[i];

}

ave[i]=sum[i]/n;

cout<<sum[i]<<"\t"<<ave[i]<<endl;

}

}

void asendingSortByName(Stu stu[],int n,int m)

{

int i,j,k,a,b;

int temp1[m];

long temp2;

char temp3[N];

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

{

k=i;

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

{

if( strcmp(stu[j].stuname,stu[k].stuname)<0 )k=j;

}

if(k!=i)

{

temp2=stu[i].stuid;

stu[i].stuid=stu[k].stuid;

stu[k].stuid=temp2;

strcpy(temp3,stu[i].stuname);

strcpy(stu[i].stuname,stu[k].stuname);

strcpy(stu[k].stuname,temp3);

a=stu[i].stusum;

stu[i].stusum=stu[k].stusum;

stu[k].stusum=a;

b=stu[i].stuave;

stu[i].stuave=stu[k].stuave;

stu[k].stuave=b;

for(int t=0; t<m; t++)

{

temp1[t]=stu[i].stuscore[t];

stu[i].stuscore[t]=stu[k].stuscore[t];

stu[k].stuscore[t]=temp1[t];

}

}

}

return;

}

void descendingSortByScore(Stu stu[],int n,int m )

{

int i,j,k,p,q;

int temp1[m];

long temp2;

char temp3[N];

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

{

k=i;

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

{

if(strcmp(stu[j].stuname,stu[k].stuname)<0)

k=j;

}

if(k!=i)

{

temp2=stu[i].stuid;

stu[i].stuid=stu[k].stuid;

stu[k].stuid=temp2;

p=stu[i].stusum;

stu[i].stusum=stu[k].stusum;

stu[k].stusum=p;

q=stu[i].stuave;

stu[i].stuave=stu[k].stuave;

stu[k].stuave=q;

strcpy( temp3,stu[i].stuname);

strcpy( stu[i].stuname,stu[k].stuname);

strcpy( stu[k].stuname,temp3);

for(int a=0;a<m;a++){

temp1[a] =stu[i].stuscore[a];

stu[i].stuscore[a]=stu[k].stuscore[a];

stu[k].stuscore[a]=temp1[a];

}

}

}

return;

}

void SearchByName(Stu stu[],int n,int m)

{

char selectname[N];

int i;

descendingSortByScore(stu,n, m); //先按成绩降序排列

printf("请输入要查询的姓名:");

cin.get(); //清除前面回车符

cin.getline(selectname,N); //输入要查询的名字

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

{

if(!strcmp(stu[i].stuname,selectname))

{

cout<<stu[i].stuname<<"学生，排在第"<<i+1<<"成绩为";

for(int j=0;j<m;j++){

cout<<"各科成绩为"<<stu[i].stuscore[j]<<"\t";

}

cout<<"总分为"<<stu[i].stusum<<"\t"<<"平均分为"<<stu[i].stuave<<endl;

return;

}

}

cout<<"\nNot found!\n";

return;

}

void sort(Stu stu[],int n,int m)

{

int score;

int i,j,k,p;

double l;

cin >> score;

if (n >= 0 && n < 60)

cout << "不及格" << endl;

else if (n >= 60 && n < 70)

cout << "及格" << endl;

else if (n >= 70 && n < 80)

cout << "中等" << endl;

else if (n >= 80 && n < 90)

cout << "良好" << endl;

else if (n >= 90 && n <= 100)

cout << "优秀" << endl;

}

int main()

{

Stu stu[M];

int n,m,choice;

cout<<"请输入总人数和课程数：";

cin>>n>>m;

do

{

cout<<"\n1: 输入学生信息\n";

cout<<"2: 输出各科成绩的总分与平均分\n";

cout<<"3: 按姓名的字典循序排出成绩表\n";

cout<<"4: 按姓名查询学生的总分排名\n";

cout<<"5: 统计每个类别的人数以及所占的百分比\n";

cout<<"0: 退出\n";

cout<<"请选择需要的功能：";

cin>>choice; // 输入选项

switch(choice)

{

case 1:

readstu (stu,n,m); //调用输入学号、成绩函数

break;

case 2: //按成绩由高到低排列，即降序

printe(stu,n,m);

break;

case 3: //按姓名的字典循序排出成绩表

asendingSortByName(stu,n,m);

printstu(stu,n,m);

break;

case 4: //按姓名查询学生排名

SearchByName(stu,n,m);

break;

case 5:

sort(stu,n,m);

break;

case 0: //退出

exit(1); //退出系统

break;

default:

cout<<"输入错误，请重新输入！\n";

}

}

while(1);

return 0;

}