#include<iostream>

#include<wchar.h>//宽字符调用函数库

#include<locale.h>// 设置本地语言

#include<string.h>

using namespace std;

#define LEN1 sizeof(struct Student)

#define LEN2 sizeof(struct Course)

struct Student //记录学生信息表一

{

int ID;//学号

char \*Name;//姓名

char\* Course\_name[10] = {NULL};//所选课程名称

int C\_ID[10] ;

struct Student\* next;

};

struct Course

{

int C\_ID;//课程号

char \*Course\_name;//课程名称

int Course\_stu=0;

struct Student\* stu[10];

struct Course\* next;

};

void Dispaly\_course(struct Course\*p){//输出学生信息

struct Course\* p1;

p1 = p;

if (p1 != NULL)

{

cout << p1->Course\_name << endl

<< "选择该课程的学生有" << p1->Course\_stu << "人" << endl;

if (p1->Course\_stu != 0) {

cout << "分别是以下同学:" << endl;

for (int i = 0; i < p1->Course\_stu; i++) {

cout << p1->stu[i]->Name<<"\t";

}

cout << endl;

}

}

}

void Dispaly\_student(struct Student\* p) {//输出课程信息

struct Student\* p1;

p1 = p;

if (p1!= NULL)

{

cout << "学生的学号为:" << p1->ID << "\t"

<< "该学生姓名为：" << p1->Name << endl;

if (p1->Course\_name[0] == NULL) {

cout << "该学生还没有选择任何课程";

}

else

cout << "已选择课程有：";

for (int i = 0; p1->Course\_name[i] != NULL; i++) {

cout <<p1->C\_ID[i]<<"、"<< p1->Course\_name[i] << "\t";

}

cout << endl;

}

}

void Course\_selection(struct Course\* cour, Student\* stu){//选课函数

struct Course\* cour1;

cour1 = cour;

Student\* stu1;

stu1 = stu;

int ID\_stu, ID\_cour;

int flag=1;

int i ;

cout << "请输入要选课的学生的学号:" << endl;

cin >> ID\_stu;

for ( i = ID\_stu - 1; i > 0; i--) {//将指针指向需要选课的学生

stu1 = stu1->next;

}

cout << "该学生的选课信息如下"<<endl;

Dispaly\_student(stu1); //调用函数打印当前学生选课信息

cout << "你现在有以下课程可选:" << endl;

while (cour1->next!=NULL)//打印可选课程

{

cout <<cour1->C\_ID<<"、"<< cour1->Course\_name << "\t";

cour1 = cour1->next;

}

cour1 = cour;

cout <<endl<< "请输入要选择课程的ID:";

cin >> ID\_cour;

for (int j = 1; j < ID\_cour; j++)//将指针指向被选择的课程

cour1 = cour1->next;

i = 0;

for (i = 0; stu1->C\_ID[i] != 0; i++) {

if (ID\_cour == stu1->C\_ID[i]) {//判断是否重复选课

cout << "该课程已经在学生的选课列表中了，请不要重复选择" << endl;

flag = 0;

break;

}

else

flag = 1;

}

if (flag)//没有重复选课

{

stu1->C\_ID[i] = cour1->C\_ID;//将课程号存储在学生信息中

stu1->Course\_name[i] = cour1->Course\_name;//课程名称

cour1->Course\_stu = cour1->Course\_stu + 1;//选课人数+1

cour1->stu[cour1->Course\_stu-1] = stu1;

cout << "已成功选择" << cour1->Course\_name << endl;

Dispaly\_student(stu1);

}

}

void Course\_delete(Student\* stu, Course\* cour) {//退课函数

struct Course\* cour1;

cour1 = cour;

Student\* stu1;

stu1 = stu;

int ID\_stu, ID\_cour;

int i;

int flag;

cout << "请输入学生学号：";

cin >> ID\_stu;

for ( i = ID\_stu - 1; i > 0; i--) {//指针指向需要退课的学生

stu1 = stu1->next;

}

cout << "该学生的选课信息如下" << endl;

Dispaly\_student(stu1);

if (stu1->C\_ID[0] != 0) {//判断学生是否选有课程

cout << "请输入要删除的课程的ID：";

cin >> ID\_cour;

for (i = 0; stu1->C\_ID[i] != 0; i++) {

if (ID\_cour == stu1->C\_ID[i]) {//判断学生是否选了这门课

for (int j = 1; j < ID\_cour; j++)//将指针指向被删除选课

cour1 = cour1->next;

cour1->Course\_stu--;//选课人数-1

for ( int j = 0; j < cour1->Course\_stu+1; j++)//删除选中该课程的同学的信息

{

if (stu1->ID == cour1->stu[j]->ID) {

if (j == cour1->Course\_stu) {

cour1->stu[j] = NULL;

}

else

cour1->stu[j] = cour1->stu[j + 1];

}

}

cout << stu1->Course\_name[i] << "已删除" << endl;//删除学生中该课程的信息

if (i < 10) {

for (int j = i; j < 10; j++) {

if (j == 10) {

stu1->Course\_name[j] = NULL;

stu1->C\_ID[j] = 0;

}

else {

stu1->Course\_name[j] = stu1->Course\_name[j + 1];

stu1->C\_ID[j] = stu1->C\_ID[j + 1];

}

}

}

break;

}

if (stu1->C\_ID[i + 1] == 0) {

cout << "该学生没有选择该课程";

}

}

}

}

void Search\_cour(Course\* cour) {

Course\* cour1;

cour1 = cour;

int ID\_cour;

cout << "你现在有以下课程可选择查询:" << endl;

while (cour1->next != NULL)//打印可查询课程

{

cout << cour1->C\_ID << "、" << cour1->Course\_name << "\t";

cour1 = cour1->next;

}

cour1 = cour;

cout << endl << "请输入要选择课程的ID:";

cin >> ID\_cour;

for (int j = 1; j < ID\_cour; j++)//指针指向需要查询的课程

cour1 = cour1->next;

cout << "你选择查询的课程信息是：" ;

Dispaly\_course(cour1);//调用函数打印该课程信息

}

void Search\_stu(Student\* stu){//学生选课查询

Student\* stu1;

stu1 = stu;

while (stu1->next!=NULL)

{

Dispaly\_student(stu1);

stu1 = stu1->next;

}

}

int main() {

//setlocale(LC\_ALL, "chs"); //设置为中文输出

char\* course[7] = { "高数", "线代", "大物", "大英", "离散","近代史","马原" };

char\* stu\_name[5] = { "zlt","wzy","zyq","zq","zrx" };

struct Course\* c1,\*c2;

struct Student\* stu1,\*stu2;

int flag = 1;

stu1 = (struct Student\*)malloc(LEN1);//开辟内存

c1 = (struct Course\*)malloc(LEN2);

c2 = c1;

stu2 = stu1;

for (int i = 0, j=1; i < 7; i++,j++) {//这里定义了七门课

c2->Course\_name = course[i];

c2->Course\_stu = 0;

c2->C\_ID = j;

for (int j = 0; j < 10; j++) {

c2->stu[j] = NULL;

}

c2->next=(struct Course\*)malloc(LEN2);

c2 = c2->next;

}

for (int i = 0, j = 1; i < 5; i++) {//这里开辟了5个儿子的存储空间

stu2->Name = stu\_name[i];

stu2->ID = j++;

for (int i = 0; i < 10; i++) {

stu2->Course\_name[i] = NULL;

stu2->C\_ID[i] = 0;

}

stu2->next = (struct Student\*)malloc(LEN1);

stu2 = stu2->next;

}

stu2->next = NULL;

c2->next = NULL;

stu2 = NULL;

stu2 = stu1;

stu2->Course\_name[0] = c1->Course\_name;//先初始化一个数据，用于测试

c1->Course\_stu++;

stu2->C\_ID[0] = c1->C\_ID;

c1->stu[0] = stu2;

c2 = NULL;

c2 = c1;

while (c2->next != NULL)//调用函数，打印课程信息

{

Dispaly\_course(c2);

c2 = c2->next;

}

while (stu2->next!=NULL)//调用函数打印，学生信息

{

Dispaly\_student(stu2);

stu2 = stu2->next;

}

cout << "——————欢迎来到学生选课系统——————" << endl;

while (flag)

{

cout << "请选择你要使用的功能：1、选课\t2、退课\t3、已选课程\t4、课程信息\t5、退出系统"<<endl;

cin >> flag;

switch (flag)

{

case 1: {

Course\_selection(c1, stu1);

break;

}

case 2: {

Course\_delete(stu1,c1);

break;

}

case 3: {

Search\_stu(stu1);

break;

}

case 4: {

Search\_cour(c1);

break;

}

case 5: {

cout << "已退出系统";

flag = 0;

break;

}

default:cout << "输入有误，请重新输入";

break;

}

}

return 0;

}