#include "stdafx.h"

#include"iostream"

#include "stdio.h"

#include"string"

using namespace System;

using namespace std;

#define M 100

//结构体的设定

struct space

{

int Number;//分区号

int Saddress;//起始地址

int length;//长度

char sign[5];//占用标志

struct space\* next;

};

//初始化结构体链表

void Initialize(struct space\* S1, struct space\* S2, struct space\* S3, struct space\* S4, struct space\* S5, struct space\* S6)

{

S1->Number=1;

S1->Saddress = 0;

S1->length = 10;

strcpy(S1->sign, "0");

S2->Number=2;

S2->Saddress = 10;

S2->length = 18;

strcpy(S2->sign, "J1");

S3->Number = 3;

S3->Saddress = 28;

S3->length = 16;

strcpy(S3->sign, "J2");

S4->Number = 4;

S4->Saddress = 44;

S4->length = 6;

strcpy(S4->sign, "0");

S5->Number = 5;

S5->Saddress = 50;

S5->length = 21;

strcpy(S5->sign, "0");

S6->Number = 6;

S6->Saddress = 71;

S6->length = 30;

strcpy(S6->sign, "0");

}

//分配表的输出函数

void table(struct space\* S1, struct space\* S2, struct space\* S3, struct space\* S4, struct space\* S5, struct space\* S6)

{

struct space \*p;

int j = 0;

cout << "以下为当前分配表" << endl;

cout << "分区号\t 起始地址\t长度\t占用标志\t" << endl;

for (p = S1, j = 0; j<6; j++, p = p->next)

{

printf("%d\t%d\t\t%d\t%s\n", p->Number, p->Saddress, p->length, p->sign);

}

cout << endl;

}

//主程序如下

int main()

{

int m, ask, Msize = M, Mname, i,j,z,n;

char course[5];

struct space \*S1, \*S2, \*S3, \*S4, \*S5, \*S6, \*p;

//为结构体结点申请空间

S1 = (struct space\*) malloc(sizeof (struct space));

S2 = (struct space\*) malloc(sizeof (struct space));

S3 = (struct space\*) malloc(sizeof (struct space));

S4 = (struct space\*) malloc(sizeof (struct space));

S5 = (struct space\*) malloc(sizeof (struct space));

S6 = (struct space\*) malloc(sizeof (struct space));

//设置结构体结点的关系

S1->next = S2;

S2->next = S3;

S3->next = S4;

S4->next = S5;

S5->next = S6;

Initialize(S1,S2,S3,S4,S5,S6);//初始化

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

{

Msize = M;

cout << "请选择你要申请还是释放空间：申请请输入1，释放请输入0：" << endl;

scanf("%d", &m);

getchar();

//申请空间函数

while(m==1)

{

cout << "请输入你要申请空间的进程名以及空间大小（用空格隔开）" << endl;

scanf("%s%d", course, &ask);

getchar();

for (p = S1, j= 0; j< 6; j++, p = p->next)

{

if (strcmp(p->sign, "0") == 0)

{

if (p->length >= ask && p->length - ask < Msize)

{

Msize = p->length - ask;

Mname = p->Number;

}

}

}

if (Msize == M)

{

cout << "分配失败\n" << endl; m = 5;

break;

}

for (p = S1, n = 0; n < 6; n++, p = p->next)

{

if (p->Number == Mname)

{

strcpy(p->sign, course); break;

}

}

table(S1, S2, S3, S4, S5, S6);

break;

}

//释放空间函数

if (m == 0)

{

cout << "请输入你要释放空间的进程名" << endl;

gets(course);

for (p = S1, z = 0; z < 6; z++, p = p->next)

{

if (strcmp(p->sign, course) == 0)

{

strcpy(p->sign, "0"); table(S1, S2, S3, S4, S5, S6); break;

}

}

}

}

return 0;

}