1650254 尤尧寅 计算机一班链表指针思考题

源程序过程

• (设初位地址为2000)

```
int main()
{
student *head = NULL;

if (linklist_create(head) == OK) {。 。 。 。 。
}
}
```

head **NULL** 2000

```
int linklist_create(student *head)
student *p = NULL, *q = NULL;
                                              单项传值!
int i;
for (i = 0; i < 5; i++) {
if (i > 0)
q = p;
p = new(nothrow) student; //思考:为什么不能用
malloc
if (p == NULL)
return ERROR;
if (i == 0)
head = p; //head指向第1个结点
else
q - next = p;
cout << "请输入第" << i + 1 << "个人的基本信息" <<
endl;
cin >> p->name >> p->num >> p->sex; //键盘输入
基本信息
p->next = NULL;
return OK;
```

2000

2003

3000

3003

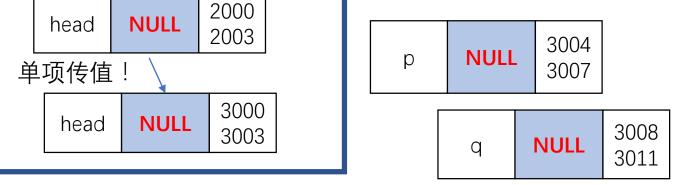
NULL

NULL

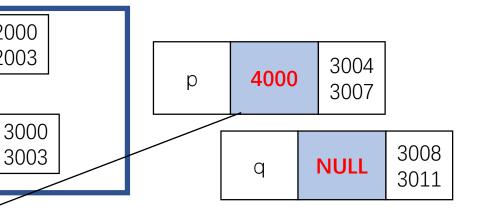
head

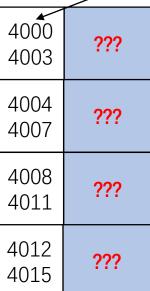
head

```
int linklist_create(student *head)
student *p = NULL, *q = NULL;
int i;
for (i = 0; i < 5; i++) {
if (i > 0)
q = p;
p = new(nothrow) student; //思考: 为什么不能用
malloc
if (p == NULL)
return ERROR;
if (i == 0)
head = p; //head指向第1个结点
else
q - next = p;
cout << "请输入第" << i + 1 << "个人的基本信息" <<
endl;
cin >> p->name >> p->num >> p->sex; //键盘输入
基本信息
p->next = NULL;
return OK;
```



```
int linklist_create(student *head)
                                                        NULL
                                                  head
student *p = NULL, *q = NULL;
                                               单项传值!
int i;
                                                         NULL
                                                  head
for (i = 0; i < 5; i++) {
if (i > 0)
q = p;
                                                    4000
p = new(nothrow) student; //思考 — 什么不能用
                                                    4003
malloc
if (p == NULL)
                                                    4004
return ERROR;
                                                    4007
if (i == 0)
                                                    4008
head = p; //head指向第1个结点
                                                    4011
else
q - next = p;
                                                    4012
cout << "请输入第" << i + 1 << "个人的基本信息" <<
                                                    4015
endl;
cin >> p->name >> p->num >> p->sex; //键盘输入
基本信息
p->next = NULL;
return OK;
```

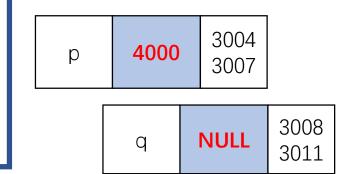




2000

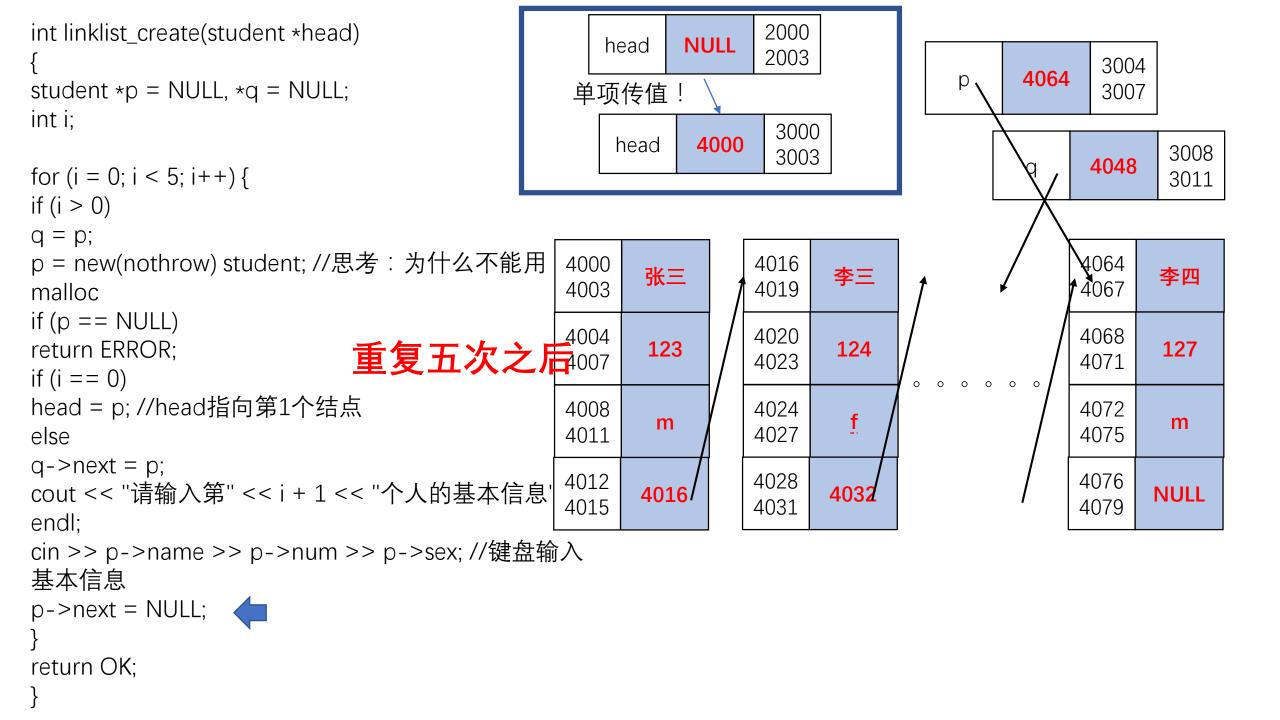
2003

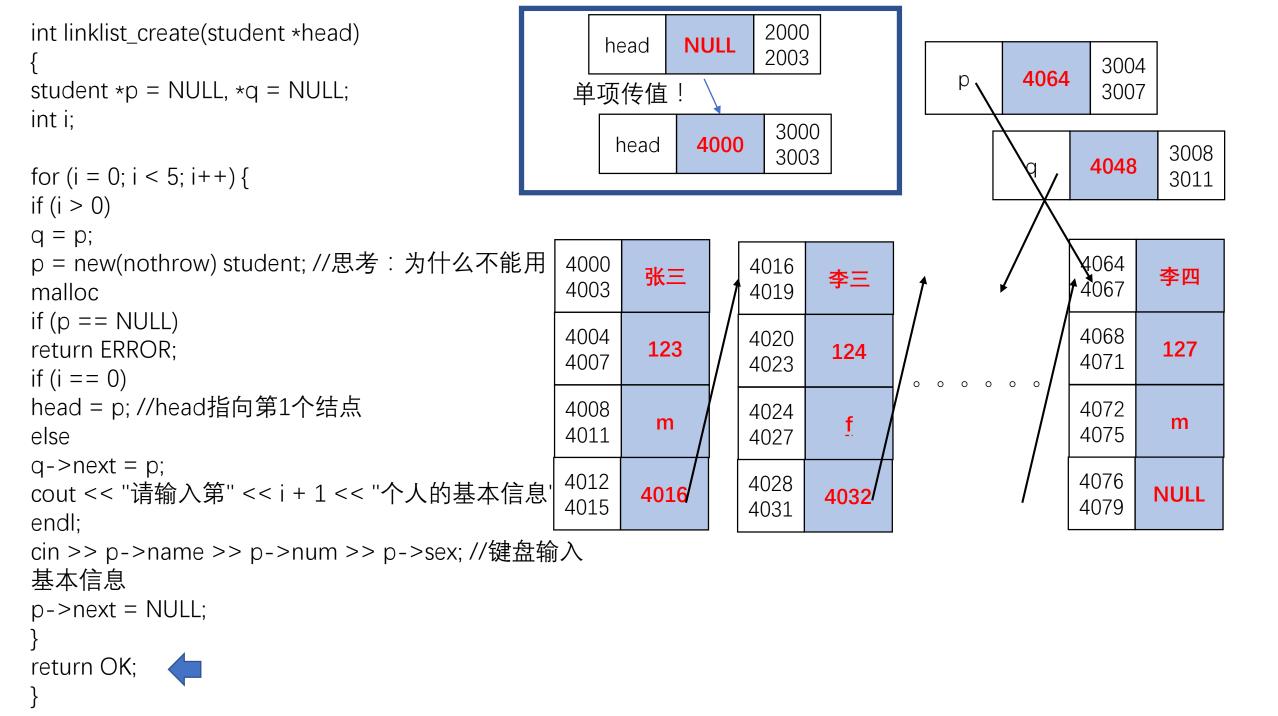
```
2000
int linklist_create(student *head)
                                                         NULL
                                                  head
                                                                2003
student *p = NULL, *q = NULL;
                                               单项传值!
int i;
                                                                 3000
                                                          4000
                                                   head
                                                                 3003
for (i = 0; i < 5; i++) {
if (i > 0)
q = p;
                                                     4000
p = new(nothrow) student; //思考: 为什么不能用
                                                             ???
                                                     4003
malloc
if (p == NULL)
                                                     4004
                                                             ???
return ERROR;
                                                     4007
if (i == 0)
                                                     4008
head = p; //head指向第1个结点
                                                             ???
                                                     4011
else
q - next = p;
                                                     4012
                                                             ???
cout << "请输入第" << i + 1 << "个人的基本信息" <<
                                                     4015
endl;
cin >> p->name >> p->num >> p->sex; //键盘输入
基本信息
p->next = NULL;
return OK;
```



```
2000
int linklist_create(student *head)
                                                         NULL
                                                  head
                                                                2003
student *p = NULL, *q = NULL;
                                               单项传值!
int i;
                                                                 3000
                                                          4000
                                                   head
                                                                 3003
for (i = 0; i < 5; i++) {
if (i > 0)
q = p;
                                                     4000
p = new(nothrow) student; //思考: 为什么不能用
                                                            张三
                                                     4003
malloc
if (p == NULL)
                                                     4004
                                                            123
return ERROR;
                                                     4007
if (i == 0)
                                                     4008
head = p; //head指向第1个结点
                                                            m
                                                     4011
else
q - next = p;
                                                    4012
                                                           NULL
cout << "请输入第" << i + 1 << "个人的基本信息" <<
                                                    4015
endl;
cin >> p->name >> p->num >> p->sex; //键盘输入
基本信息
p->next = NULL;
return OK;
```

p 4000 3004 3007 q NULL 3008 3011





```
head NULL 2000
2003
```

int main() student *head = NULL; if (linklist_create(head) = OK) {
linklist_traverse(head); linklist_destroy(head); else cout << "LinkList Create failed." << endl;</pre> return 0;

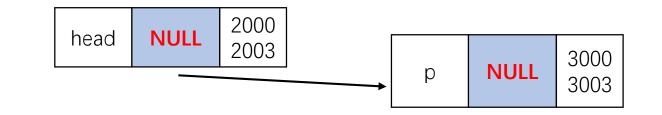
Head的值没有发生变化 局部变量空间被收回 动态空间保留

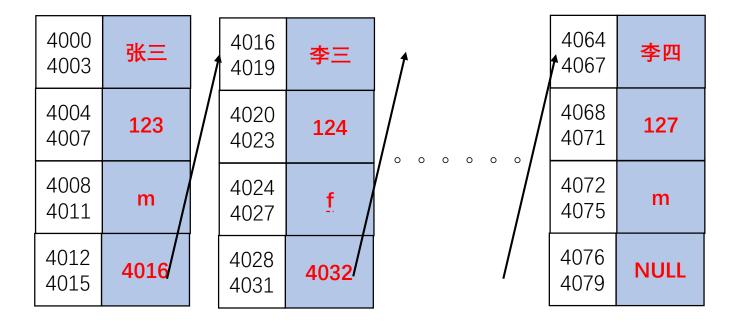
张三	4000 4003
123	4004 4007
m	4008 4011
4016	4012 4015

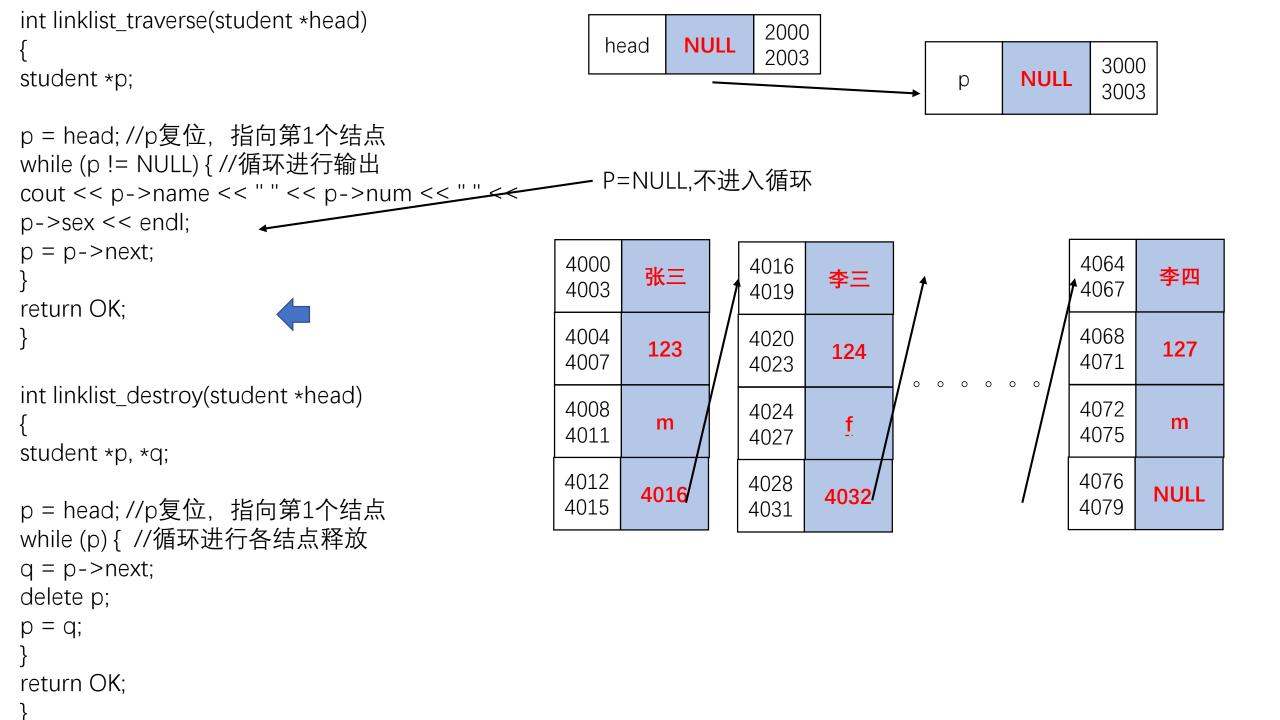
-			
	李三	4016 4019	1
	124	4020 4023	/
	<u>f</u> .	4024 4027	
	4032	4028 4031	

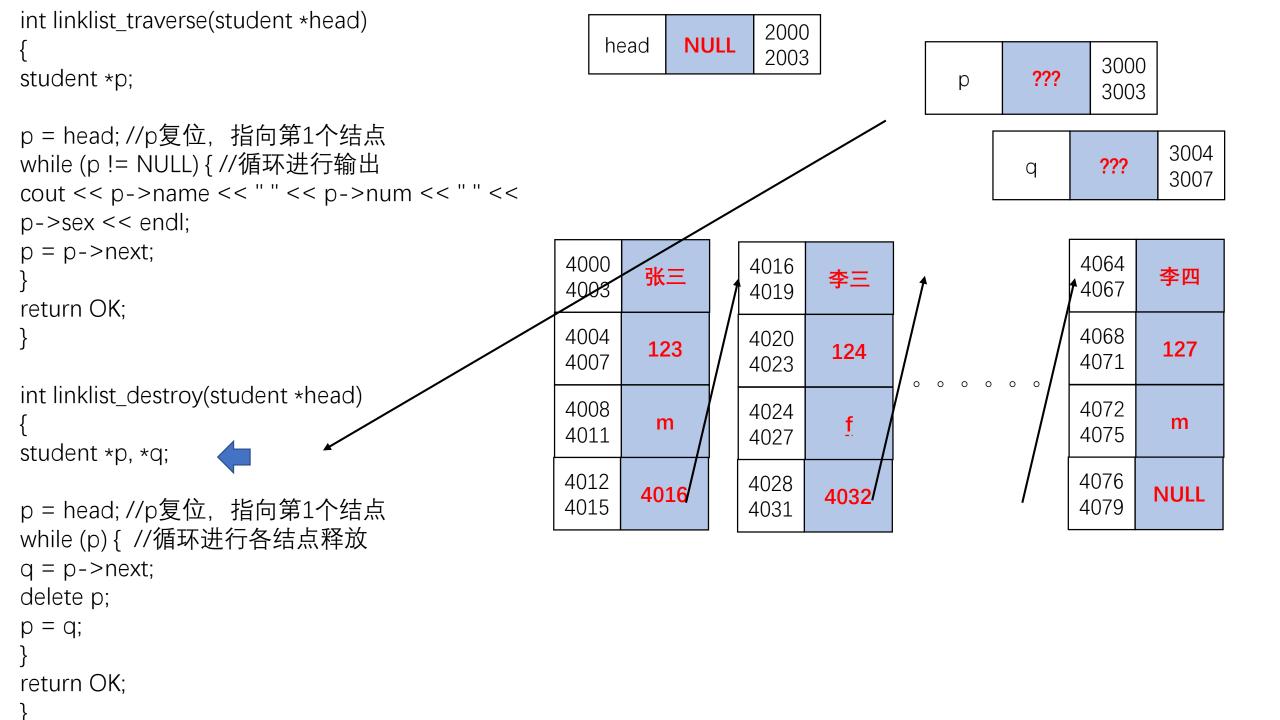
	4064 † 4067	李四
	4068 4071	127
	4072 4075	m
/	4076 4079	NULL

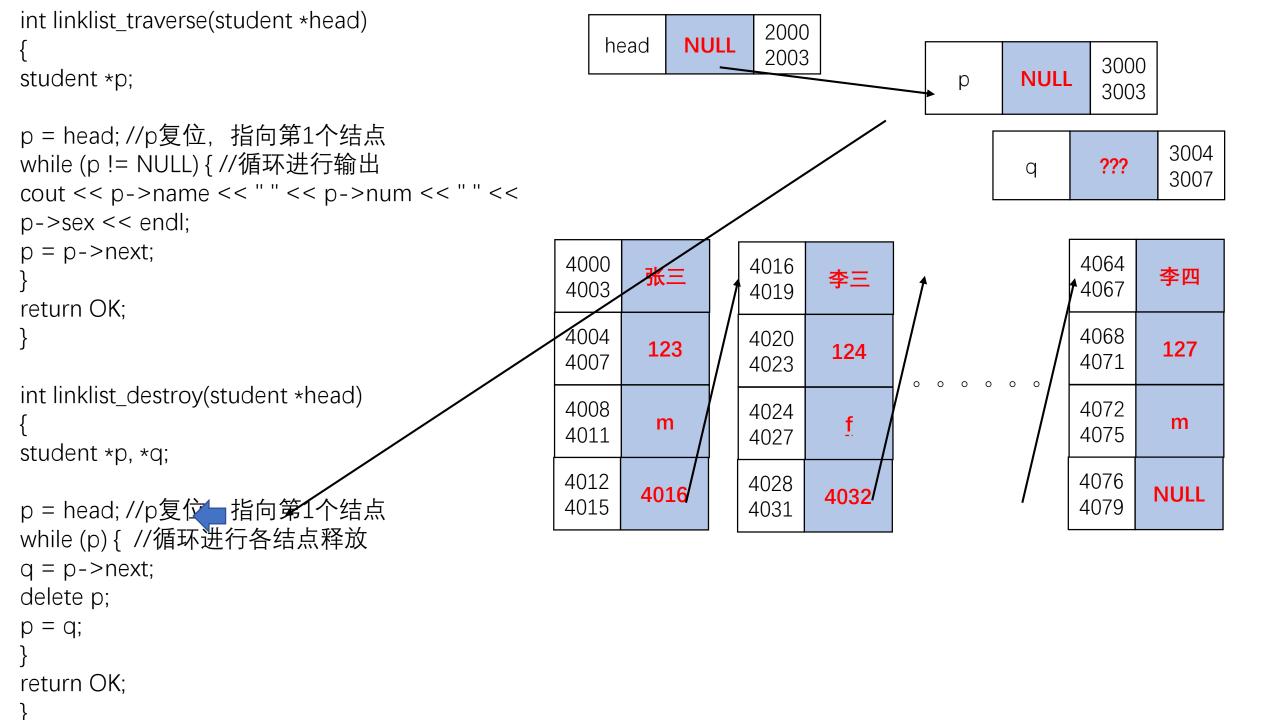
```
int linklist_traverse(student *head)
student *p;
p = head; //p复位, 指向第1个结点
while (p != NULL) { //循环进行输出
cout << p->name << " " << p->num << " " <<
p->sex << endl;
p = p - next;
return OK;
int linklist destroy(student *head)
student *p, *q;
p = head; //p复位, 指向第1个结点
while (p) { //循环进行各结点释放
q = p - next;
delete p;
p = q;
return OK;
```









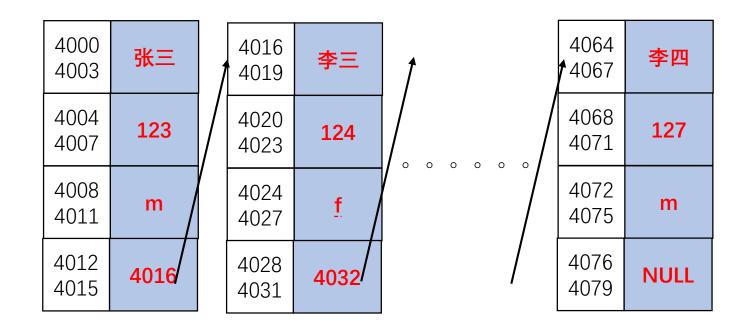


```
int linklist_traverse(student *head)
                                                                2000
                                                         NULL
                                                  head
                                                                2003
                                                                                              3000
student *p;
                                                                                       NULL
                                                                                 р
                                                                                              3003
p = head; //p复位, 指向第1个结点
                                                                                                    3004
while (p!= NULL) { //循环进行输出
                                                                                              ???
                                                                                       q
                                                  不进入循环
                                                                                                    3007
cout << p->name << " " << p->num << " " <<
p->sex << endl;
p = p - next;
                                               4000
                                                                                            4064
                                                               4016
                                                      张三
                                                                      李三
                                                                                                   李四
                                               4003
                                                                                           74067
                                                               4019
return OK;
                                               4004
                                                                                            4068
                                                               4020
                                                      123
                                                                                                   127
                                                                      124
                                               4007
                                                                                            4071
                                                               4023
int linklist destroy(student *head)
                                               4008
                                                                                            4072
                                                               4024
                                                       m
                                                                                                    m
                                               4011
                                                                                            4075
                                                               4027
student *p, *q;
                                                                                            4076
                                               4012
                                                               4028
                                                      4016
                                                                                                  NULL
                                                                      4032
                                                                                            4079
p = head; //p复位, 指向第1个结点
                                               4015
                                                               4031
while (p) { //循环进行各结点释放
q = p - next;
delete p;
                                                链表没有销毁成功
p = q;
```

return OK;

head **NULL** 2000 2003

```
int main()
student *head = NULL;
if (linklist_create(head) == OK) {
linklist_traverse(head);
linklist_destroy(head);
else
cout << "LinkList Create failed." << endl;</pre>
return 0;
```



1.链表的建立是否成功

• 成功,但因为head没有被储存下来,造成内存丢失

2.为什么遍历没有成功

- Head单向传值,主函数的head依然是NULL,在函数里直接没有进入循环
- 3.链表的销毁是否成功
- 不成功 传入的头指针不对

4.程序是否有内存丢失情况

 有,在创建链表之后,即int linklist_create(student *head)之后, 头指针丢失,无法释放内存

```
修改后代码
```

```
#include <iostream>
#include <string> //C++ string类 需要用到
using namespace std;
struct student {
string name;
int num;
char sex:
struct student *next;//指向结构体自身的指针(下个结点)
#define OK1
#define ERROR0
int linklist_create(student **head);//修改
int linklist_traverse(student *head);
int linklist destroy(student *head);
int linklist_create(student **head)//修改
student *p = NULL, *q = NULL;
int i;
for (i = 0; i < 5; i++) {
if (i > 0)
q = p;
p = new(nothrow) student; //思考:为什么不能用malloc 答:使用了string类
if (p == NULL)
return ERROR;
if (i == 0)
*head = p; //head指向第1个结点)//修改
else
q - next = p;
cout << "请输入第" << i + 1 << "个人的基本信息" << endl;
cin >> p->name >> p->num >> p->sex; //键盘输入基本信息
p->next = NULL:
return OK:
```

```
int linklist traverse(student *head)
student *p;
p = head; //p复位, 指向第1个结点
while (p!= NULL) { //循环进行输出
cout << p->name << " " << p->num << " " << p->sex <<
endl;
p = p - next;
return OK;
int linklist_destroy(student *head)
student *p, *q;
p = head; //p复位, 指向第1个结点
while (p) { //循环进行各结点释放
q = p - next;
delete p;
p = q;
return OK;
int main()
student *head = NULL;
if (linklist_create(&head) == OK) {//修改
linklist traverse(head);
linklist_destroy(head);
else
cout << "LinkList Create failed." << endl;
return 0;
```