

# C/C++程序设计案例实战

## ——黑箱里的秘密

华中农业大学信息学院 章 英

# 问题引入

a

庄小帅



地址：华中农大荟园5栋209寝室



b

李维宇



地址：华中农大博园9栋313寝室



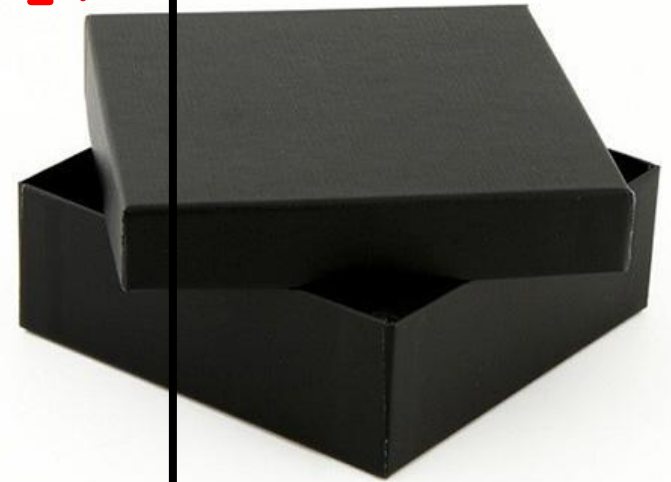
# 问题分析

庄小帅  
**a**

李维宇  
**b**



```
1 void swap(int x, int y)
2 {
3     int t;
4     t = x;
5     x = y;
6     y = t;
7 }
```

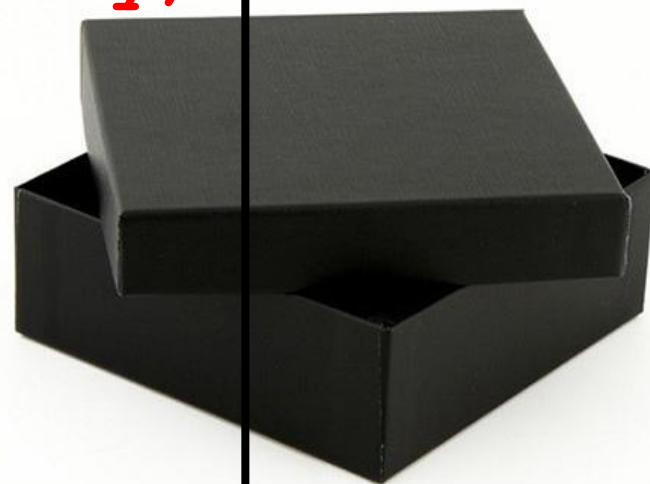


改一改

&庄小帅    &李维宇  
**&a**        **&b**



```
1 void swap(int *x, int *y)
2 {
3     int *t;
4     t = x;
5     x = y;
6     y = t;
7 }
```



**x**

5栋209

**y**

9栋313

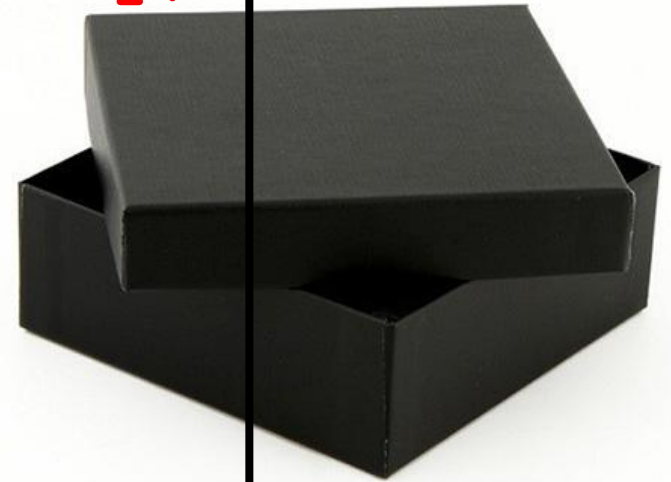
**t**

改一改

&庄小帅    &李维宇  
**&a**        **&b**



```
1 void swap(int *x, int *y)
2 {
3     int *t;
4     t = x;
5     x = y;
6     y = t;
7 }
```



**x**

5栋209

**y**

9栋313

**t**

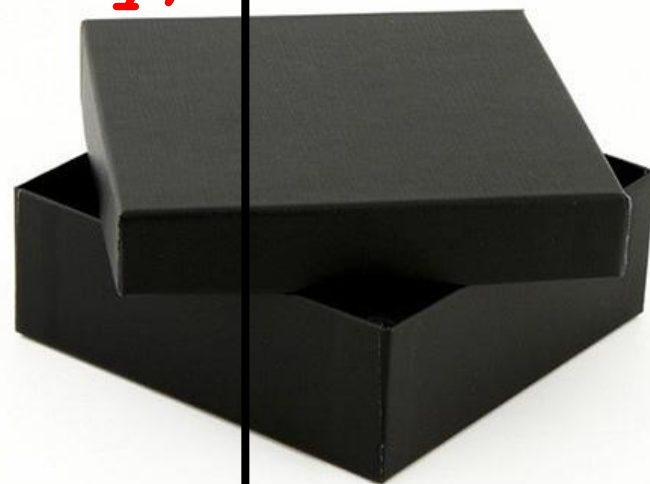
5栋209

改一改

&庄小帅    &李维宇  
**&a**        **&b**



```
1 void swap(int *x, int *y)
2 {
3     int *t;
4     t = x;
5     x = y;
6     y = t;
7 }
```



**x**

9栋313

**y**

9栋313

**t**

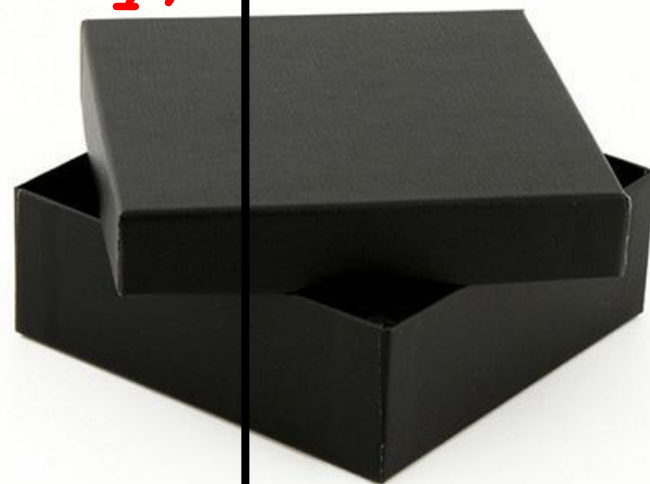
5栋209

改一改

&庄小帅   &李维宇  
**&a**        **&b**



```
1 void swap(int *x, int *y)
2 {
3     int *t;
4     t = x;
5     x = y;
6     y = t;
7 }
```



**x**

9栋313

**y**

5栋209

**t**

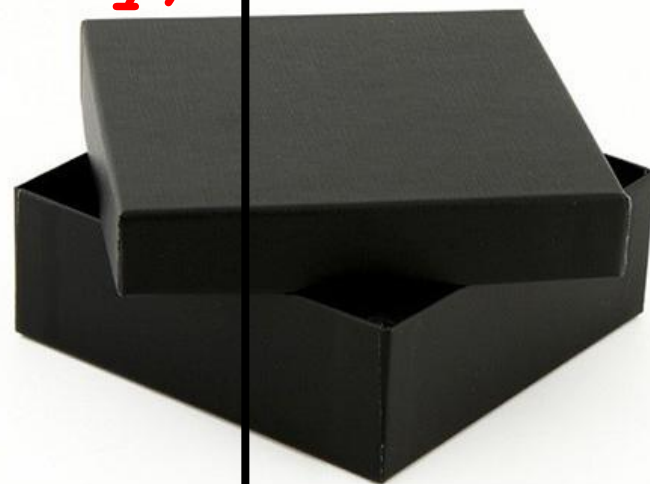
5栋209

再来改一改

&庄小帅    &李维宇  
**&a**        **&b**



```
1 void swap(int *x, int *y)
2 {
3     int t;
4     t = *x;
5     *x = *y;
6     *y = t;
7 }
```



**x**

5栋209

**y**

9栋313

**t**

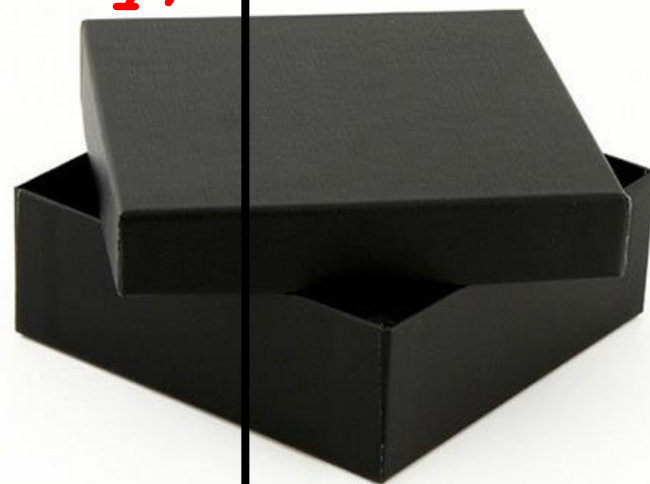


再来改一改

&庄小帅    &李维宇  
**&a**        **&b**



```
1 void swap(int *x, int *y)
2 {
3     int t;
4     t = *x;
5     *x = *y;
6     *y = t;
7 }
```



**x**

5栋209

**y**

9栋313

**t**

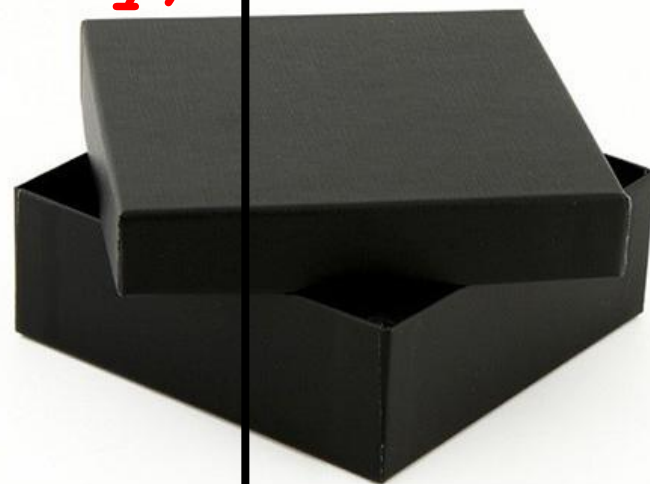
庄小帅

再来改一改

&庄小帅    &李维宇  
**&a**        **&b**



```
1 void swap(int *x, int *y)
2 {
3     int t;
4     t = *x;
5     *x = *y; //a=b;
6     *y = t;   //b=t;
7 }
```



**x**

5栋209

**y**

9栋313

**t**

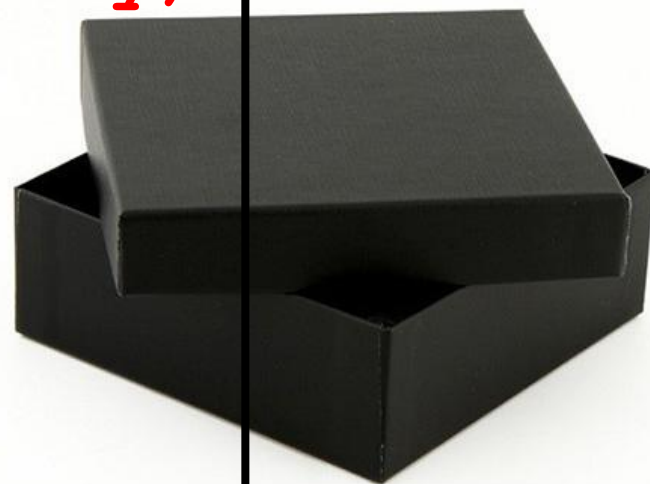
庄小帅

再来改一改

&庄小帅    &李维宇  
**&a**        **&b**



```
1 void swap(int *x, int *y)
2 {
3     int t;
4     t = *x;
5     *x = *y; // a=b;
6     *y = t; // b=t;
7 }
```



**x**

5栋209

**y**

9栋313

**t**

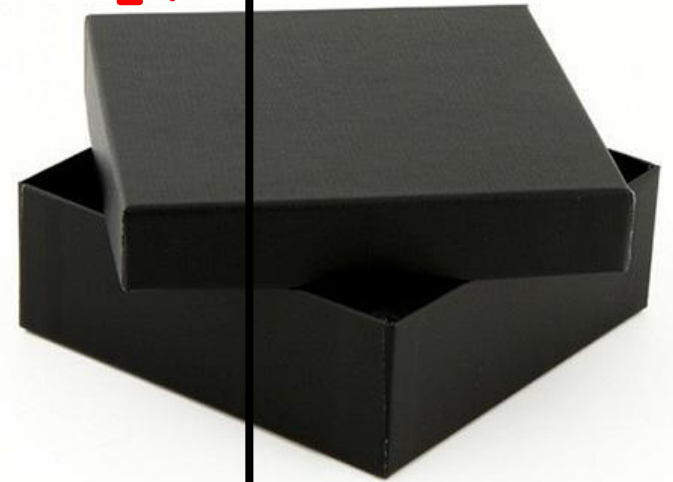
庄小帅

# 判一判

&庄小帅    &李维宇  
**&a**        **&b**



```
1 void swap(int *x, int *y)
2 {
3     int *t;
4     *t = *x;
5     *x = *y;
6     *y = *t;
7 }
```



**x**

5栋209

**y**

9栋313

**t**

# 1号黑箱——代码实现

```
1  #include<iostream>
2  using namespace std;
3  void swap1(int x, int y)
4  {
5      int t;
6      t = x;
7      x = y;
8      y = t;
9  }
10 int main()
11 {
12     int a=10,b=20;
13     swap1(a,b);
14     cout<<a<<" "<<b;
15     return 0;
16 }    //输出10 20
```

## 2号黑箱——代码实现

```
1  #include<iostream>
2  using namespace std;
3  void swap2(int *x, int *y)
4  {
5      int *t;
6      t = x;
7      x = y;
8      y = t;
9  }
10 int main()
11 {
12     int a=10, b=20;
13     swap2(&a, &b);
14     cout<<a<<" "<<b;
15     return 0;
16 }    //输出10 20
```

### 3号黑箱——代码实现

```
1  #include<iostream>
2  using namespace std;
3  void swap3(int *x, int *y)
4  {
5      int t;
6      t = *x;
7      *x = *y;
8      *y = t;
9  }
10 int main()
11 {
12     int a=10, b=20;
13     swap3(&a, &b);
14     cout<<a<<" "<<b;
15     return 0;
16 }    //输出20 10
```

## 4号黑箱——代码实现

```
1  #include<iostream>
2  using namespace std;
3  void swap4 (int *x, int *y)
4  {
5      int *t;
6      *t = *x;
7      *x = *y;
8      *y = *t;
9  }
10 int main ()
11 {
12     int a=10, b=20;
13     swap4 (&a, &b);
14     cout<<a<<" "<<b;
15     return 0;
16 } //输出20 10
```



## 小结

- (1) 能够编写形参为指针的函数
- (2) 能够分析形参为指针的函数内部不同语句实现的不同功能

## 延伸

请编码实现通过黑箱改变数组中指定的任意两个下标的变量的值。