列表内存自动管理

案例:

```
lis = [1, 2, 3]

for item in lis:
    lis.remove(item)

print(lis)
```

为什么没有得到空列表?

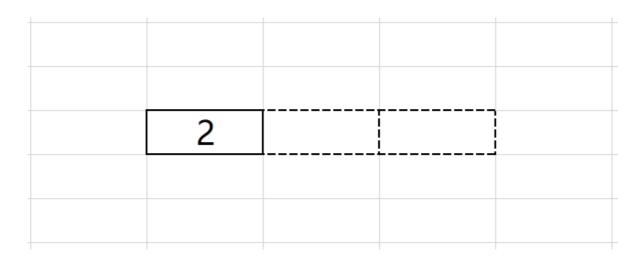
如果原列表在内存中为:

1	2	3	

那么第一次遍历执行 lis.remove(item) 时,将索引0对应的元素删除(即删除元素1),然后对列表内存进行收缩,使得后面的元素2、3都往前移动,则列表在内存中变为:

2	3	

第二次遍历执行 lis.remove(item) 时,将索引1对应的元素删除(即删除元素3);第三次遍历时会因为超出索引范围而停止遍历,所以最终的列表为[2]



列表内存自动管理功能: 在删除列表中的元素时, Python会自动对列表内存进行收缩, 并移动列表中的元素以保证元素之间没有间隙, 所以遍历删除列表中的元素时, 被删元素后面的值会向前顶, 导致漏删。

如何解决这个问题呢?

思路: 遍历一个新的列表, 不受原数据修改的影响即可

import copy

```
lis = [1, 2, 3]
lis2 = [1, 2, 3] # 思考: 换成 lis2 = lis 是否可以?
for item in lis2:
   lis.remove(item)
print(lis)
lis = [1, 2, 3]
for item in lis[:]: # 浅拷贝
   lis.remove(item)
print(lis)
lis = [1, 2, 3]
lis2 = lis.copy() # 浅拷贝
for item in lis2:
   lis.remove(item)
print(lis)
lis = [1, 2, 3]
lis2 = copy.copy(lis) # 浅拷贝
for item in lis2:
   lis.remove(item)
print(lis)
lis = [1, 2, 3]
lis2 = copy.deepcopy(lis) # 深拷贝
for item in lis2:
   lis.remove(item)
print(lis)
lis = [1, 2, 3]
lis2 = list(lis) # 返回一个新的对象,同理: tuple()/set()
也可以
for item in lis2:
```

```
lis.remove(item)
print(lis)
```

字典、集合遍历问题

字典、集合在遍历时,如果改变原数据的size,则会造成迭代时报错

```
dic = {"name": "Tom", "age": 18, "height": 188}
for key in dic:
    dic.pop(key) # 改变了原数据大小,所以报错
print(dic)

dic = {"name": "Tom", "age": 18, "height": 188}
for key in dic:
    dic.update({"weight": 88}) # 改变了原数据大小,所以报错
print(dic)

dic = {"name": "Tom", "age": 18, "height": 188}
for key in dic:
    dic.update({"age": 22}) # 没有改变原数据大小,所以不报错
print(dic)
```

```
set1 = {"name", "age", "height"}
for key in set1:
    set1.pop() # 改变了原数据大小,所以报错
print(set1)
```

```
set1 = {"name", "age", "height"}
for key in set1:
    set1.add("weight") # 改变了原数据大小,所以报错
print(set1)

set1 = {"name", "age", "height"}
for key in set1:
    set1.add("age") # 没有改变原数据大小,所以不报错
print(set1)
```

解决思路: 遍历一个新的字典/集合, 不受原数据修改的影响即可

```
import copy
dic = {"name": "Tom", "age": 18, "height": 188}
dic2 = {"name": "Tom", "age": 18, "height": 188} # 思
考: 换成 dic2 = dic 是否可以?
for key in dic2:
   dic.pop(key)
print(dic)
dic = {"name": "Tom", "age": 18, "height": 188}
dic2 = dic.copy() # 浅拷贝
for key in dic2:
   dic.pop(key)
print(dic)
dic = {"name": "Tom", "age": 18, "height": 188}
dic2 = copy.copy(dic) # 浅拷贝
for key in dic2:
   dic.pop(key)
```

```
print(dic)
dic = {"name": "Tom", "age": 18, "height": 188}
dic2 = copy.deepcopy(dic) # 深拷贝
for key in dic2:
   dic.pop(key)
print(dic)
dic = {"name": "Tom", "age": 18, "height": 188}
key_list = list(dic) # 返回一个新的对象,同理:
tuple()/set()也可以
for key in key_list:
   dic.pop(key)
print(dic)
dic = {"name": "Tom", "age": 18, "height": 188}
dict_keys = dic.keys() # 思考: 这样可以吗?
for key in dict_keys:
   dic.pop(key)
print(dic)
```