列表

数据结构

数据结构是计算机存储、组织数据的方式。

数据结构是指相互之间存在一种或多种特定关系的数据元素的集合。

序列(Sequence)

序列是Python中最基本的数据结构，序列每个元素会被分配一个序号，也就是元素的位置，叫做索引。

内置了序列类型

1. List 列表
2. Tuple 元组
3. Ranges range函数
4. Str 文本序列
5. Binary 二进制 (bytes, bytearray, memoryview)
6. Set, frozenset 集合
7. Dict 字典

列表

```
In : [1, 'a', 'test']
Out: [1, 'a', 'test']
```

append

```
In : firends = []

In : firends.append('David')

In : firends
Out: ['David']
```

extend

```
In : firends.extend(['Chris', 'Amy'])

In : firends
Out: ['David', 'Chris', 'Amy']
```

列表分片

```
In : firends
Out: ['David', 'Chris', 'Amy']

In : firends[2]
Out: 'Amy'

In : firends[-1]
Out: 'Amy'

In : firends[1:3]
Out: ['Chris', 'Amy']

In : firends[1:]
Out: ['Chris', 'Amy']

In : firends[:1]
Out: ['David']
```

分片步长

```
In : [0, 1, 2, 3, 4, 5][:]
Out: [0, 1, 2, 3, 4, 5]

In : [0, 1, 2, 3, 4, 5][0:6:1]
Out: [0, 1, 2, 3, 4, 5]

In : [0, 1, 2, 3, 4, 5][0:6:2]
Out: [0, 2, 4]

In : [0, 1, 2, 3, 4, 5][::-1]
Out: [5, 4, 3, 2, 1, 0]
```

修改元素

```
In : firends[0] = 'Andy'

In : firends
Out: ['Andy', 'Chris', 'Amy']

In : firends[1:3] = ['Sophia', 'Emma', 'Sarah']

In : firends
Out: ['Andy', 'Sophia', 'Emma', 'Sarah']
```

insert

```
In : firends.insert(1, 'Olivia')

In : firends
Out: ['Andy', 'Olivia', 'Sophia', 'Emma', 'Sarah']
```

len

```
In : l = [0, 1, 2, 3, 4, 5]

In : len(l)
Out: 6
```

删除元素

```
In : firends = ['Andy', 'Olivia', 'Sophia', 'Sarah', 'Chris']

In : del firends[0] # 明确知道索引

In : firends
Out: ['Olivia', 'Sophia', 'Sarah', 'Chris']

In : firends.pop() # 从尾部去掉一个元素
Out: 'Chris'

In : firends
Out: ['Olivia', 'Sophia', 'Sarah']

In : firends.pop(0) # 弹出特定索引
Out: 'Olivia'

In : firends
Out: ['Sophia', 'Sarah']
```

```
In : firends.remove('Sophia')

In : firends
Out[21]: ['Sarah']

In : firends.remove('Sophia')
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
<ipython-input-22-be59ed3f990b> in <module>()
----> 1 firends.remove('Sophia')

ValueError: list.remove(x): x not in list
```

搜索元素

```
In : l = [1, 2, 1, 3]

In : l.index(1)
Out: 0

In : l.index(1, 1)
Out: 2

In : l.index(6)
---------------------------------------------------------------------------
ValueError                                Traceback (most recent call last)
<ipython-input-87-104d3dc2be54> in <module>()
----> 1 l.index(6)

ValueError: 6 is not in list

In : 3 in l
Out: True

In : 6 in l
Out: False
```

排序

```
In : l = [1, 3, 2]

In : sorted(l)
Out: [1, 2, 3]

In : l
Out: [1, 3, 2]

In : l.sort()

In : l
Out: [1, 2, 3]
```

reverse

```
In : list(reversed(l))
Out: [3, 2, 1]

In : l.reverse()

In : l
Out: [3, 2, 1]

In : sorted([1, 3, 2], reverse=False)
Out: [1, 2, 3]

In : sorted([1, 3, 2], reverse=True)
Out: [3, 2, 1]
```

延伸阅读

1. https://developers.google.com/edu/python/lists
2. https://developers.google.com/edu/python/sorting