

# Concatenating Lists Using +

We can create a new list  
by adding two existing  
lists together

```
>>> a = [1, 2, 3]
>>> b = [4, 5, 6]
>>> c = a + b
>>> print(c)
[1, 2, 3, 4, 5, 6]
>>> print(a)
[1, 2, 3]
```

# Lists Can Be Sliced Using :

```
>>> t = [9, 41, 12, 3, 74, 15]
>>> t[1:3]
[41, 12]
>>> t[:4]
[9, 41, 12, 3]
>>> t[3:]
[3, 74, 15]
>>> t[:]
[9, 41, 12, 3, 74, 15]
```

**Remember:** Just like in strings, the second number is “up to but not including”

# List Methods

```
>>> x = list()
>>> type(x)
<type 'list'>
>>> dir(x)
['append', 'count', 'extend', 'index', 'insert',
'pop', 'remove', 'reverse', 'sort']
>>>
```

<http://docs.python.org/tutorial/datastructures.html>

# Building a List from Scratch

- We can create an empty **list** and then add elements using the **append** method
- The **list** stays in order and new elements are **added** at the end of the **list**

```
>>> stuff = list()
>>> stuff.append('book')
>>> stuff.append(99)
>>> print(stuff)
['book', 99]
>>> stuff.append('cookie')
>>> print(stuff)
['book', 99, 'cookie']
```

# Is Something in a List?

- Python provides two operators that let you check if an item is in a list
- These are logical operators that return **True** or **False**
- They do not modify the list

```
>>> some = [1, 9, 21, 10, 16]
>>> 9 in some
True
>>> 15 in some
False
>>> 20 not in some
True
>>>
```

# Lists are in Order

- A **list** can hold many items and keeps those items in the order until we do something to change the order
- A **list** can be **sorted** (i.e., change its order)
- The **sort** method (unlike in strings) means “**sort yourself**”

```
>>> friends = [ 'Joseph', 'Glenn', 'Sally' ]
>>> friends.sort()
>>> print(friends)
['Glenn', 'Joseph', 'Sally']
>>> print(friends[1])
Joseph
>>>
```

# Built-in Functions and Lists

- There are a number of **functions** built into **Python** that take **lists** as parameters
- Remember the loops we built? These are much simpler.

```
>>> nums = [3, 41, 12, 9, 74, 15]
>>> print(len(nums))
6
>>> print(max(nums))
74
>>> print(min(nums))
3
>>> print(sum(nums))
154
>>> print(sum(nums)/len(nums))
25.6
```

```
total = 0
count = 0
while True :
    inp = input('Enter a number: ')
    if inp == 'done' : break
    value = float(inp)
    total = total + value
    count = count + 1
```

```
average = total / count
print('Average: ', average)
```

Enter a number: 3

Enter a number: 9

Enter a number: 5

Enter a number: done

Average: 5.66666666666667

```
numlist = list()
while True :
    inp = input('Enter a number: ')
    if inp == 'done' : break
    value = float(inp)
    numlist.append(value)
```

```
average = sum(numlist) / len(numlist)
print('Average: ', average)
```