PythonTip 02 - List Slicing

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1 List Slicing

List slicing is a way to get not just one element of a list, but a whole portion.

[1]:
```
L = ["a", "b", "c", "d", "e", "f"]
L[2]
```

[1]:
```
'c'
```

`L[a:b]` means the portion of the list from index `a` (inclusive) to index `b` (exclusive).

[2]:
```
L[2:5] # [L[2], L[3], L[4]]
```

[2]:
```
['c', 'd', 'e']
```

If you leave out `a`, it starts from the beginning of the list. If you leave out `b`, it goes to the end.

[3]:
```
L[:4]
```

[3]:
```
['a', 'b', 'c', 'd']
```

[4]:
```
L[1:]
```

[4]:
```
['b', 'c', 'd', 'e', 'f']
```

[5]:
```
print(L[:])
```

```
['a', 'b', 'c', 'd', 'e', 'f']
```

[6]:
```
R = L[:] # a copy of the list!
R = list(L) # another way to do the same thing
```

[7]:
```
R.pop(0)
```

[7]:
```
'a'
```

[8]:
```
print(R)
print(L)
```

```
['b', 'c', 'd', 'e', 'f']
['a', 'b', 'c', 'd', 'e', 'f']
```

[13]:
```
L = [1,2,3,4,5]

def func(l):
    lcopy = list(l)
    total = sum(lcopy)
    lcopy.append(total)
```

[14]:
```
L
```

[14]: [1, 2, 3, 4, 5]

[15]:
```
func(L)
```

[16]:
```
L
```

[16]: [1, 2, 3, 4, 5]

[ ]:
```

```

You can use a third piece `L[a:b:c]`, and `c` means how much to go up by each time.

[17]:
```
print(L[1:5:2])
print([L[1], L[3]])
```

```
[2, 4]
[2, 4]
```

[18]:
```
L = list(range(0, 21))
print(L)
```

```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20]
```

[19]:
```
L[::3]
```

[19]: [0, 3, 6, 9, 12, 15, 18]

[ ]:
```

```

[20]:
```
L[::-1]
```

[20]: [20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0]

[21]:
```
L[::-2]
```

[21]: [20, 18, 16, 14, 12, 10, 8, 6, 4, 2, 0]

Lastly, you can use negative indexing too. For example, to get the last 3 elements of a list:

[22]:
```
L[-3]
```

[22]:
```
18
```

[23]:
```
L[-3:]
```

[23]:
```
[18, 19, 20]
```

[24]:
```
L[len(L)-3:]
```

[24]:
```
[18, 19, 20]
```

To get all except the last element:

[ ]:
```
L[:len(L)-1]
```

[25]:
```
L[:-1]
```

[25]:
```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]
```

[ ]:
```

```

[ ]:
```

```

[26]:
```
L
```

[26]:
```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20]
```

[27]:
```
L[:round(len(L)/2)]
```

[27]:
```
[0, 1, 2, 3, 4, 5, 6, 7, 8, 9]
```

[28]:
```
L[round(len(L)/2):]
```

[28]:
```
[10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20]
```

[ ]:
```
L[:5]
```

[ ]:
```
L[5:]
```