

Lists

Lists

```
[1, 2, 3]
```

```
["Project", "Homework", "Test", "Exam"]
```

```
[8.15, 9.45]
```

```
[]
```

```
[1, "Homework", 8.15]
```

Index

1	-2	3	-4	5
0	1	2	3	4

list[*index*]

```
>>> ourlist = [1, -2, 3, -4, 5]
```

```
>>> element = ourlist[1]
```

```
>>> print element
```

```
-2
```

Number of elements (or length)

1	-2	3	-4	5
0	1	2	3	4

`len(list)`

```
>>> ourlist = [1, -2, 3, -4, 5]
```

```
>>> len(ourlist)
```

```
5
```

Slicing

1	-2	3	-4	5	-6	7	8	-9	1	1
0	1	2	3	4	5	6	7	8	9	10

```
>>> ourlist = [1, -2, 3, -4, 5, -6, 7, 8, -9, 1, 1]
```

```
>>> print ourlist[3:8]
```

```
[-4, 5, -6, 7, 8]
```

```
>>> print ourlist[4:]
```

```
[5, -6, 7, 8, -9, 1, 1]
```

```
>>> print ourlist[:9]
```

```
[1, -2, 3, -4, 5, -6, 7, 8, -9]
```

```
>>> print ourlist[:]
```

```
[1, -2, 3, -4, 5, -6, 7, 8, -9, 1, 1]
```

```
>>> print ourlist[-3:]
```

```
[-9, 1, 1]
```

Operations with lists

- Concatenation +

```
>>> list1 = [1, 2, 3]
```

```
>>> list2 = [-4, -5]
```

```
>>> list1+list2
```

```
[1, 2, 3, -4, -5]
```

- Multiplication *

```
>>> [1, 2, 3]*3
```

```
[1, 2, 3, 1, 2, 3, 1, 2, 3]
```

Function range

```
>>> range(4)
```

```
[0, 1, 2, 3]
```

```
>>> range(2, 5)
```

```
[2, 3, 4]
```

```
>>> range(3, 10, 2)
```

```
[3, 5, 7, 9]
```

```
>>> range(10, 3, -2)
```

```
[10, 8, 6, 4]
```

Looping through lists

```
ourlist = [-1,2,-3,4,-5]
```

```
for el in ourlist: #el is element  
    print el
```

```
for i in range(len(ourlist)): #i is index  
    print ourlist[i] #ourlist[i] is element
```


Logical expressions with lists

```
>>> 1 in [1, 2, 3]
```

```
True
```

```
>>> -2 in [1, 2, 3]
```

```
False
```

```
>>> 5 not in [1, 2, 3]
```

```
True
```

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

```
False
```

```
>>> [1, 2, 3] != [3, 4, 5]
```

```
True
```

Lists are mutable

```
>>> ourlist = [1,-2,3,-4,5]
```

```
>>> ourlist[1] = 10
```

```
>>> print ourlist
```

```
[1, 10, 3, -4, 5]
```

Methods

append pop
count remove
extend reverse
index sort
insert

Functions

len
sum
max
min
sorted

`ourlist.sort()`

`sum(ourlist)`

<https://docs.python.org/2/tutorial/datastructures.html>

<https://docs.python.org/2/library/functions.html>

Other expressions and operations: `[1,2]+[2,1]`

`[1,2]*2`

`2 in [2,1]`

`[1,2]==[2,1]`

Building a list

```
f = open("numbers.txt")
```

```
numbers = []
```

```
for line in f:
```

```
    number = int(line)
```

```
    numbers.append(number)
```

```
print numbers
```

List from a string (`split`)

```
>>> "Hello world".split()
```

```
['Hello', 'world']
```

```
>>> date = "27.10.2017"
```

```
>>> date.split(".")
```

```
['27', '10', '2017']
```

Test 7

Questions?

Homework (Celsius and Fahrenheit,
Number of days in months)

Questions?