**Python Lists**

This is an introduction to Python lists, as used in the CodingBat [Python practice problems](http://codingbat.com/python), specifically in the [List-1](http://codingbat.com/python/List-1) and [List-2](http://codingbat.com/python/List-2) sections.

A Python list can hold any number of things in a linear collection (similar to the "array" in other languages). Use the len() function to check the length of a list and the square bracekts [ ] to access individual elements (in this way, lists work just like strings):

a = ['hi', 'there', '!'] # a list with 3 elements

len(a) ## 3

a[0] ## 'hi'

a[2] = 'ho' ## Can change an existing element

The .append(value) method on a list adds an element to its end, and the sorted(list) function takes in a list and returns a new list sorted into increasing order:

a = ['hi', 'there']

a.append('aa') ## use .append() to add elements to the end

a.append('bb')

## now a is ['hi', 'there', 'aa', 'bb']

b = sorted(a) # b is ['aa', 'bb', 'hi', 'there'], a is unchanged

**Python List Loop**

The easiest way to access elements in a list with a loop:

a = [1, 2, 3]

sum = 0

for num in a: ## iterate num over values 1, 2, 3

sum = sum + num

Another way to loop over a list is using the range(n) function witch returns the sequence 0, 1, 2, ... n-1, so for i in range(len(list)): iterates over the index numbers of a list, like this:

a = ['hi', 'there', 'ok']

result = ''

for i in range(len(a)):

# i will be 0, 1, 2 ... use a[i] to look at each element.

# Here we just accumulate the a[i] strings

result = result + a[i]

This form of loop gives flexiblity to refer to the element to the left (a[i-1]) or the next element (a[i+1]) within the loop, however be careful not to refer past the end of the list, len(a)-1 is the max allowed index.

Python lists also support the "slice" syntax to refer to subparts of a list -- slices are discussed in the [Python Strings](http://codingbat.com/doc/python-strings.html) doc, and work analogously for lists.

Sorting: the easiest way to sort a list is with the sorted(list) function which takes in any collection and returns a new list, sorted into increasing order.

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