

Python Lists

```
mylist = ["apple", "banana", "cherry"]
```

List

Lists are used to store multiple items in a single variable.

Lists are one of 4 built-in data types in Python used to store collections of data, the other 3 are [Tuple](#), [Set](#), and [Dictionary](#), all with different qualities and usage.

Lists are created using square brackets:

Example

Create a List:

```
thislist = ["apple", "banana", "cherry"]  
print(thislist)
```

List Items

List items are ordered, changeable, and allow duplicate values.

List items are indexed, the first item has index `[0]`, the second item has index `[1]` etc.

Ordered

When we say that lists are ordered, it means that the items have a defined order, and that order will not change.

If you add new items to a list, the new items will be placed at the end of the list.

Note: There are some list methods that will change the order, but in general: the order of the items will not change.

Changeable

The list is changeable, meaning that we can change, add, and remove items in a list after it has been created.

Allow Duplicates

Since lists are indexed, lists can have items with the same value:

Example

Lists allow duplicate values:

```
thislist = ["apple", "banana", "cherry", "apple", "cherry"]  
print(thislist)
```

List Length

To determine how many items a list has, use the `len()` function:

Example

Print the number of items in the list:

```
thislist = ["apple", "banana", "cherry"]  
print(len(thislist))
```

List Items - Data Types

List items can be of any data type:

Example

String, int and boolean data types:

```
list1 = ["apple", "banana", "cherry"]  
list2 = [1, 5, 7, 9, 3]  
list3 = [True, False, False]
```

A list can contain different data types:

Example

A list with strings, integers and boolean values:

```
list1 = ["abc", 34, True, 40, "male"]
```

type()

From Python's perspective, lists are defined as objects with the data type 'list':

```
<class 'list'>
```

Example

What is the data type of a list?

```
mylist = ["apple", "banana", "cherry"]  
print(type(mylist))
```

The list() Constructor

It is also possible to use the `list()` constructor when creating a new list.

Example

Using the `list()` constructor to make a List:

```
thislist = list(("apple", "banana", "cherry")) # note the double  
round-brackets  
print(thislist)
```

Python - Access List Items

Access Items

List items are indexed and you can access them by referring to the index number:

Example

Print the second item of the list:

```
thislist = ["apple", "banana", "cherry"]  
print(thislist[1])
```

Note: The first item has index 0.

Negative Indexing

Negative indexing means start from the end

-1 refers to the last item, **-2** refers to the second last item etc.

Example

Print the last item of the list:

```
thislist = ["apple", "banana", "cherry"]  
print(thislist[-1])
```

Range of Indexes

You can specify a range of indexes by specifying where to start and where to end the range.

When specifying a range, the return value will be a new list with the specified items.

Example

Return the third, fourth, and fifth item:

```
thislist =  
["apple", "banana", "cherry", "orange", "kiwi", "melon", "mango"]  
print(thislist[2:5])
```

Note: The search will start at index 2 (included) and end at index 5 (not included).

Remember that the first item has index 0.

By leaving out the start value, the range will start at the first item:

Example

This example returns the items from the beginning to, but NOT including, "kiwi":

```
thislist =  
["apple", "banana", "cherry", "orange", "kiwi", "melon", "mango"]  
print(thislist[:4])
```

By leaving out the end value, the range will go on to the end of the list:

Example

This example returns the items from "cherry" to the end:

```
thislist =  
["apple", "banana", "cherry", "orange", "kiwi", "melon", "mango"]  
print(thislist[2:])
```

Range of Negative Indexes

Specify negative indexes if you want to start the search from the end of the list:

Example

This example returns the items from "orange" (-4) to, but NOT including "mango" (-1):

```
thislist =  
["apple", "banana", "cherry", "orange", "kiwi", "melon", "mango"]  
print(thislist[-4:-1])
```

Check if Item Exists

To determine if a specified item is present in a list use the `in` keyword:

Example

Check if "apple" is present in the list:

```
thislist = ["apple", "banana", "cherry"]
if "apple" in thislist:
    print("Yes, 'apple' is in the fruits list")
```

Change Item Value

To change the value of a specific item, refer to the index number:

Example

Change the second item:

```
thislist = ["apple", "banana", "cherry"]
thislist[1] = "blackcurrant"
print(thislist)
```

Change a Range of Item Values

To change the value of items within a specific range, define a list with the new values, and refer to the range of index numbers where you want to insert the new values:

Example

Change the values "banana" and "cherry" with the values "blackcurrant" and "watermelon":

```
thislist = ["apple", "banana", "cherry", "orange", "kiwi", "mango"]
thislist[1:3] = ["blackcurrant", "watermelon"]
print(thislist)
```

If you insert *more* items than you replace, the new items will be inserted where you specified, and the remaining items will move accordingly:

Example

Change the second value by replacing it with *two* new values:

```
thislist = ["apple", "banana", "cherry"]
thislist[1:2] = ["blackcurrant", "watermelon"]
print(thislist)
```

Note: The length of the list will change when the number of items inserted does not match the number of items replaced.

If you insert *less* items than you replace, the new items will be inserted where you specified, and the remaining items will move accordingly:

Example

Change the second and third value by replacing it with *one* value:

```
thislist = ["apple", "banana", "cherry"]  
thislist[1:3] = ["watermelon"]  
print(thislist)
```

Insert Items

To insert a new list item, without replacing any of the existing values, we can use the `insert()` method.

The `insert()` method inserts an item at the specified index:

Example

Insert "watermelon" as the third item:

```
thislist = ["apple", "banana", "cherry"]  
thislist.insert(2, "watermelon")  
print(thislist)
```

Note: As a result of the example above, the list will now contain 4 items.

Append Items

To add an item to the end of the list, use the `append()` method:

Example

Using the `append()` method to append an item:

```
thislist = ["apple", "banana", "cherry"]  
thislist.append("orange")  
print(thislist)
```

Insert Items

To insert a list item at a specified index, use the `insert()` method.

The `insert()` method inserts an item at the specified index:

Example

Insert an item as the second position:

```
thislist = ["apple", "banana", "cherry"]  
thislist.insert(1, "orange")  
print(thislist)
```