Python Lists

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,

Python Collections (Arrays)

There are four collection data types in the Python programming language:

- **List** is a collection which is ordered and changeable. Allows duplicate members.
- **Tuple** is a collection which is ordered and unchangeable. Allows duplicate members.
- **Set** is a collection which is unordered, unchangeable*, and unindexed. No duplicate members.
- **Dictionary** is a collection which is ordered** and changeable. No duplicate members.

Lists are created using square brackets:

Example

Create a List:

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

Try it Yourself »

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)
```

Try it Yourself »

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))
```

Try it Yourself »

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]
```

Try it Yourself »

A list can contain different data types:

Example

A list with strings, integers and boolean values:

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

Try it Yourself »

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))
```

Try it Yourself »

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])
```

Try it Yourself »

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])
```

Try it Yourself »

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])
```

Try it Yourself »

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])
```

Try it Yourself »

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:])
```

Try it Yourself »

Python - Add List 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)
```

Try it Yourself »

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)
```

Try it Yourself »

Note: As a result of the examples above, the lists will now contain 4 items.

Extend List

To append elements from *another list* to the current list, use the `extend()` method.

Example

Add the elements of `tropical` to `thislist`:

```
thislist = ["apple", "banana", "cherry"]
tropical = ["mango", "pineapple", "papaya"]
thislist.extend(tropical)
print(thislist)
```

Try it Yourself »

The elements will be added to the *end* of the list.

Python - Remove List Item

Remove Specified Item

The `remove()` method removes the specified item.

Example

Remove "banana":

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

Try it Yourself »

If there are more than one item with the specified value, the `remove()` method removes the first occurrence:

Example

Remove the first occurrence of "banana":

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

Try it Yourself »

Remove Specified Index

The `pop()` method removes the specified index.

Example

Remove the second item:

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

Try it Yourself »

If you do not specify the index, the `pop()` method removes the last item.

Example

Remove the last item:

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

Try it Yourself »

The `del` keyword also removes the specified index:

Example

Remove the first item:

```
thislist = ["apple", "banana", "cherry"]
del thislist[0]
print(thislist)
```

Try it Yourself »

The `del` keyword can also delete the list completely.

Example

Delete the entire list:

```
thislist = ["apple", "banana", "cherry"]
del thislist
```

Try it Yourself »

Clear the List

The `clear()` method empties the list.

The list still remains, but it has no content.

Example

Clear the list content:

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

Try it Yourself »

Python - Sort Lists

Sort List Alphanumerically

List objects have a `sort()` method that will sort the list alphanumerically, ascending, by default:

Example

Sort the list alphabetically:

```
thislist = ["orange", "mango", "kiwi", "pineapple", "banana"]
thislist.sort()
print(thislist)
```

Try it Yourself »

Example

Sort the list numerically:

```
thislist = [100, 50, 65, 82, 23]
thislist.sort()
print(thislist)
```

Try it Yourself »

Sort Descending

To sort descending, use the keyword argument `reverse = True`:

Example

Sort the list descending:

```
thislist = ["orange", "mango", "kiwi", "pineapple", "banana"]
thislist.sort(reverse = True)
print(thislist)
```

Try it Yourself »

Example

Sort the list descending:

```
thislist = [100, 50, 65, 82, 23]
thislist.sort(reverse = True)
print(thislist)
```

Try it Yourself »

Reverse Order

What if you want to reverse the order of a list, regardless of the alphabet?

The `reverse()` method reverses the current sorting order of the elements.

Example

Reverse the order of the list items:

```
thislist = ["banana", "Orange", "Kiwi", "cherry"]
thislist.reverse()
print(thislist)
```

Try it Yourself »

Copy a List

You cannot copy a list simply by typing `list2 = list1`, because: `list2` will only be a *reference* to `list1`, and changes made in `list1` will automatically also be made in `list2`.

Use the copy() method

You can use the built-in List method `copy()` to copy a list.

Example

Make a copy of a list with the `copy()` method:

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

Try it Yourself »

Use the list() method

Another way to make a copy is to use the built-in method `list()`.

Example

Make a copy of a list with the `list()` method:

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

Try it Yourself »

Use the slice Operator

You can also make a copy of a list by using the `:` (slice) operator.

Example

Make a copy of a list with the `:` operator:

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

Try it Yourself »

Join Two Lists

There are several ways to join, or concatenate, two or more lists in Python.

One of the easiest ways are by using the `+` operator.

Example

Join two list:

```
list1 = ["a", "b", "c"]
list2 = [1, 2, 3]

list3 = list1 + list2
print(list3)
```

Try it Yourself »

Or you can use the `extend()` method, where the purpose is to add elements from one list to another list:

Example

Use the `extend()` method to add list2 at the end of list1:

```
list1 = ["a", "b" , "c"]
list2 = [1, 2, 3]

list1.extend(list2)
print(list1)
```

Try it Yourself »

List Methods

Python has a set of built-in methods that you can use on lists.

Method	Description
append()	Adds an element at the end of the list
clear()	Removes all the elements from the list
copy()	Returns a copy of the list
count()	Returns the number of elements with the specified value
extend()	Add the elements of a list (or any iterable), to the end of the current list
index()	Returns the index of the first element with the specified value
insert()	Adds an element at the specified position
pop()	Removes the element at the specified position
remove()	Removes the item with the specified value
reverse()	Reverses the order of the list
sort()	Sorts the list