Python Lists

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 and unindexed. No duplicate members.
* **Dictionary** is a collection which is unordered, changeable and indexed. No duplicate members.

When choosing a collection type, it is useful to understand the properties of that type. Choosing the right type for a particular data set could mean retention of meaning, and, it could mean an increase in efficiency or security.

List

A list is a collection which is ordered and changeable. In Python lists are written with square brackets.

Example

Create a List:

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

Access Items

You access the list items by referring to the index number:

Example

Print the second item of the list:

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

Negative Indexing

Negative indexing means beginning 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 "orange":

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" and 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 index -4 (included) to index -1 (excluded)

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

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)

Loop Through a List

You can loop through the list items by using a for loop:

Example

Print all items in the list, one by one:

thislist = ["apple", "banana", "cherry"]  
for x in thislist:  
  print(x)

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")

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))

Add 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)

To add an item at the specified index, use the insert() method:

Example

Insert an item as the second position:

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

Remove Item

There are several methods to remove items from a list:

Example

The remove() method removes the specified item:

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

Example

The pop() method removes the specified index, (or the last item if index is not specified):

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

Example

The del keyword removes the specified index:

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

Example

The del keyword can also delete the list completely:

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

Example

The clear() method empties the list:

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

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.

There are ways to make a copy, one way is to use the built-in List method copy().

Example

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

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

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)

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)

Another way to join two lists are by appending all the items from list2 into list1, one by one:

Example

Append list2 into list1:

list1 = ["a", "b" , "c"]  
list2 = [1, 2, 3]  
  
for x in list2:  
  list1.append(x)  
  
print(list1)

Or you can use the extend() method, which 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)

The list() Constructor

It is also possible to use the list() constructor to make a new list.

Example

Using the list() constructor to make a List:

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

**Take List from User:**

lst = []

# number of elemetns as input

n = int(input("Enter number of elements : "))

# iterating till the range

for i in range(0, n):

ele = int(input())

lst.append(ele) # adding the element

print(lst)