



Overview of Python

Containers and Python's Built-in Types

Python lists:

Group objects in specific order
Useful when ordering of objects is important
Can contain different types of Python objects (including other lists)

List items:

Are ordered sequentially and indexed by position in list (starting at 0)
Can be accessed by their position
Can be reassigned by their position (lists are mutable)
Lists can be sliced and concatenated

Python strings:

Are ordered groups of textual "characters"
Can contain letters, numbers, whitespace, unicode characters, etc.
Can create with matched pairs of single, double, or triple quotes (allows for embedded strings)
Can be indexed and sliced like lists
Are immutable like tuples
Can be concatenated with the + operator



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Python dictionaries:

Group Python objects by mapping keys (k) to values (v)

Associate one set of data with another (k-v pairs)

Are created with curly brackets

Are similar to lists but identified by user-specified keys rather than an integer index indicating position

Key-value pairs appear in no guaranteed order

Within dictionaries:

Entries are accessed via square brackets

An item can be accessed by its key

An item can be reassigned by its key (dictionaries are mutable)

Additionally:

Many Python objects are valid as keys, but not mutable containers like lists and dictionaries

Dictionaries cannot be sliced like lists (no order)



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Python sets:

A group of unique Python objects with no intrinsic order

Lookup is very fast compared to list

Are like mathematical sets

Syntax

```
list.append(elmnt)
```

```
list.insert(pos, elmnt)
```

List Methods

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

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

String Methods

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

Method	Description
<u>capitalize()</u>	Converts the first character to upper case
<u>casefold()</u>	Converts string into lower case
<u>center()</u>	Returns a centered string
<u>count()</u>	Returns the number of times a specified value occurs in a string
<u>encode()</u>	Returns an encoded version of the string
<u>endswith()</u>	Returns true if the string ends with the specified value
<u>expandtabs()</u>	Sets the tab size of the string
<u>find()</u>	Searches the string for a specified value and returns the position of where it was found
<u>format()</u>	Formats specified values in a string
<u>format_map()</u>	Formats specified values in a string
<u>index()</u>	Searches the string for a specified value and returns the position of where it was found
<u>isalnum()</u>	Returns True if all characters in the string are alphanumeric
<u>isalpha()</u>	Returns True if all characters in the string are in the alphabet
<u>isascii()</u>	Returns True if all characters in the string are ascii characters
<u>isdecimal()</u>	Returns True if all characters in the string are decimals
<u>isdigit()</u>	Returns True if all characters in the string are digits
<u>isidentifier()</u>	Returns True if the string is an identifier
<u>islower()</u>	Returns True if all characters in the string are lower case
<u>isnumeric()</u>	Returns True if all characters in the string are numeric

Set Methods

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

Method	Description
<code>add()</code>	Adds an element to the set
<code>clear()</code>	Removes all the elements from the set
<code>copy()</code>	Returns a copy of the set
<code>difference()</code>	Returns a set containing the difference between two or more sets
<code>difference_update()</code>	Removes the items in this set that are also included in another, specified set
<code>discard()</code>	Remove the specified item
<code>intersection()</code>	Returns a set, that is the intersection of two other sets
<code>intersection_update()</code>	Removes the items in this set that are not present in other, specified set(s)
<code>isdisjoint()</code>	Returns whether two sets have a intersection or not
<code>issubset()</code>	Returns whether another set contains this set or not
<code>issuperset()</code>	Returns whether this set contains another set or not
<code>pop()</code>	Removes an element from the set
<code>remove()</code>	Removes the specified element
<code>symmetric_difference()</code>	Returns a set with the symmetric differences of two sets
<code>symmetric_difference_update()</code>	inserts the symmetric differences from this set and another
<code>union()</code>	Return a set containing the union of sets
<code>update()</code>	Update the set with the union of this set and others

Tuple Methods

Python has two built-in methods that you can use on tuples.

Method	Description
<u>count()</u>	Returns the number of times a specified value occurs in a tuple
<u>index()</u>	Searches the tuple for a specified value and returns the position of where it was found

Dictionary Methods

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

Method	Description
<code>clear()</code>	Removes all the elements from the dictionary
<code>copy()</code>	Returns a copy of the dictionary
<code>fromkeys()</code>	Returns a dictionary with the specified keys and value
<code>get()</code>	Returns the value of the specified key
<code>items()</code>	Returns a list containing a tuple for each key value pair
<code>keys()</code>	Returns a list containing the dictionary's keys
<code>pop()</code>	Removes the element with the specified key
<code>popitem()</code>	Removes the last inserted key-value pair
<code>setdefault()</code>	Returns the value of the specified key. If the key does not exist: insert the key, with the specified value
<code>update()</code>	Updates the dictionary with the specified key-value pairs
<code>values()</code>	Returns a list of all the values in the dictionary

Populate a list with a for loop

```
nums = [12, 8, 21, 3, 16]
new_nums = []
for num in nums:
    new_nums.append(num + 1)
print(new_nums)
```

```
[13, 9, 22, 4, 17]
```

A list comprehension

```
nums = [12, 8, 21, 3, 16]
new_nums = [num + 1 for num in nums]
print(new_nums)
```

```
[13, 9, 22, 4, 17]
```