

Python Tuple

A tuple is a collection similar to a [Python list](#). The primary difference is that we cannot modify a tuple once it is created.

Create a Python Tuple

We create a tuple by placing items inside parentheses (). For example,

```
numbers = (1, 2, -5)

print(numbers)

# Output: (1, 2, -5)
```

More on Tuple Creation

Create a Tuple Using tuple() Constructor

We can also create a tuple using a [tuple\(\)](#) constructor. For example,

```
tuple_constructor = tuple(('Jack', 'Maria', 'David'))
print(tuple_constructor)

# Output: ('Jack', 'Maria', 'David')
```

Different Types of Python Tuples

Here are the different types of tuples we can create in Python.

Empty Tuple

```
# create an empty tuple
empty_tuple = ()
print(empty_tuple)

# Output: ()
```

Tuple of different data types

```
# tuple of string types
names = ('James', 'Jack', 'Eva')
print (names)

# tuple of float types
float_values = (1.2, 3.4, 2.1)
print(float_values)
```

Tuple of mixed data types

```
# tuple including string and integer
mixed_tuple = (2, 'Hello', 'Python')
print(mixed_tuple)

# Output: (2, 'Hello', 'Python')
```

Tuple Characteristics

Tuples are:

- **Ordered** - They maintain the order of elements.
 - **Immutable** - They cannot be changed after creation.
 - **Allow duplicates** - They can contain duplicate values.
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Access Tuple Items

Each item in a tuple is associated with a number, known as a **index**.

The index always starts from **0**, meaning the first item of a tuple is at index **0**, the second item is at index **1**, and so on.

Access Items Using Index

We use index numbers to access tuple items. For example,

```
languages = ('Python', 'Swift', 'C++')

# access the first item
print(languages[0])    # Python

# access the third item
print(languages[2])    # C++
```

Tuple Cannot be Modified

Python tuples are immutable (unchangeable). We cannot add, change, or delete items of a tuple.

If we try to modify a tuple, we will get an error. For example,

```
cars = ('BMW', 'Tesla', 'Ford', 'Toyota')

# trying to modify a tuple
cars[0] = 'Nissan'      # error

print(cars)
```

Python Tuple Length

We use the [len\(\)](#) function to find the number of items present in a tuple. For example,

```
cars = ('BMW', 'Tesla', 'Ford', 'Toyota')
print('Total Items:', len(cars))

# Output: Total Items: 4
```

Iterate Through a Tuple

We use the [for loop](#) to iterate over the items of a tuple. For example,

```
fruits = ('apple', 'banana', 'orange')

# iterate through the tuple
for fruit in fruits:
    print(fruit)
```

Output

```
apple
banana
```

More on Python Tuple

Check if an Item Exists in the Tuple

We use the `in` keyword to check if an item exists in the tuple. For example,

```
colors = ('red', 'orange', 'blue')

print('yellow' in colors)    # False
print('red' in colors)       # True
```

Here,

- **yellow** is not present in `colors`, so, `'yellow' in colors` evaluates to `False`
- **red** is present in `colors`, so, `'red' in colors` evaluates to `True`

Change Tuple Items

Python Tuples are **immutable** - we cannot change the items of a tuple once created.

If we try to do so, we will get an error. For example,

```
fruits = ('apple', 'cherry', 'orange')

# trying to change the second item to 'banana'
fruits[1] = 'banana'

print(fruits)

# Output: TypeError: 'tuple' object does not support item assignment
```

Delete Tuples

We cannot delete individual items of a tuple. However, we can delete the tuple itself using the [del](#) statement. For example,

```
animals = ('dog', 'cat', 'rat')

# deleting the tuple
del animals
```

Here, we have deleted the *animals* tuple.

Create a Python Tuple With One Item

When we want to create a tuple with a single item, we might do the following:

```
var = ('Hello')
print(var)  # string
```

But this would not create a tuple; instead, it would be considered a [string](#).

To solve this, we need to include a trailing comma after the item. For example,

```
var = ('Hello',)
print(var)  # tuple

# Output: ('Hello',)
```

Also Read:

- [Python Tuple Methods](#)

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