

# Python Define and Unpack Tuple

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## 1 Tuple

Go to the [RMD](#), [PDF](#), or [HTML](#) version of this file. Go back to [fan's Python Code Examples Repository \(bookdown site\)](#).

```
import numpy as np
```

### 1.1 Tuple Example

A tuple is created with parenthesis on the sides (or no parenthesis), not brackets on the sides. Can access values in a tuple as in list.

```
# Define Tuple, with and without parenthesis
tp_abc = ('a', 'b', 'c')
tp_abc_noparent = 'a', 'b', 'c'
print(f'{tp_abc=}')
```

```
## tp_abc=('a', 'b', 'c')
print(f'{len(tp_abc)=}')
```

```
## len(tp_abc)=3
print(f'{tp_abc_noparent=}')
```

```
## tp_abc_noparent=('a', 'b', 'c')
print(f'{(tp_abc==tp_abc_noparent)=}')
```

*# Check Type*

```
## (tp_abc==tp_abc_noparent)=True
print(f'{isinstance(tp_abc, list)=}')
```

```
## isinstance(tp_abc, list)=False
print(f'{isinstance(tp_abc, tuple)=}')
```

*# select element*

```
## isinstance(tp_abc, tuple)=True
```

```

print(f'{tp_abc[1]=}')

## tp_abc[1]='b'
Convert tuple to a list:
# convert Tuple to list
ls_abc = [i for i in tp_abc]
print(f'{ls_abc=}')

## ls_abc=['a', 'b', 'c']
print(f'{isinstance(ls_abc, list)=}')

## isinstance(ls_abc, list)=True
print(f'{isinstance(ls_abc, tuple)=}')

## isinstance(ls_abc, tuple)=False
Since the tuple is not mutable, we can not change values inside the tuple:
# define the tuple
tp_abc = ('a', 'b', 'c')
# update tuple value
try:
    tp_abc[0] = 'efg'
except TypeError as error:
    print('Caught this error: ' + repr(error))

## Caught this error: TypeError("'tuple' object does not support item assignment")

```

## 1.2 Function Returns Tuple and Unpack

When a function returns multiple *items* in a list, that is a tuple. Each element of the list can be accessed. And the tuple can be unpacked:

```

# Results from some function
tp_results = 'a', 123, [1,2,3]
# Unpack the results
a_st, b_int, c_ls_int = tp_results
# Print
print(f'{tp_results=}')

## tp_results=('a', 123, [1, 2, 3])
print(f'{a_st=}')

## a_st='a'
print(f'{b_int=}')

## b_int=123
print(f'{c_ls_int=}')

## c_ls_int=[1, 2, 3]

```