

# Tuple

## Tuple is a sequence datastructure.

characteristics

- Ordered: Elements in a tuple maintain a specific sequence.
- Immutable: Once created, the elements of a tuple cannot be altered, added, or removed.
- Heterogeneous: Tuples can contain elements of varying data types, such as integers, strings, and even other tuples.
- Finite Length: Tuples have a fixed number of elements.
- Allow Duplicates: They can contain repeated values.

## Tuple Creation

```
In [2]: tup=() #Empty tuple
```

```
In [3]: tup1=(10,20,90) #Tuple of integers
```

```
In [4]: tup2=(2.3,8.9,34.0,12.5) #Tuple of floats
```

```
In [5]: tup3=("hello","hi","how are you") # Tuple of strings
```

```
In [6]: tup4=(45,2.6,"sneha",(4+3j),[2,3,"hi"],(23,78)) #Tuple of mixed data types
```

```
In [7]: tup5=((3,"hlo",90),("2",8,6),(3.4,5.9,9.0)) # Nested tuple
```

## Tuple Indexing

```
In [9]: tup4
```

```
Out[9]: (45, 2.6, 'sneha', (4+3j), [2, 3, 'hi'], (23, 78))
```

```
In [10]: tup4[0]
```

```
Out[10]: 45
```

```
In [11]: tup4[-1]
```

```
Out[11]: (23, 78)
```

```
In [13]: tup4[5]
```

```
Out[13]: (23, 78)
```

## Tuple Slicing

```
In [14]: tup4
```

```
Out[14]: (45, 2.6, 'sneha', (4+3j), [2, 3, 'hi'], (23, 78))
```

```
In [16]: tup4[:]
```

```
Out[16]: (45, 2.6, 'sneha', (4+3j), [2, 3, 'hi'], (23, 78))
```

```
In [15]: tup4[1:6]
```

```
Out[15]: (2.6, 'sneha', (4+3j), [2, 3, 'hi'], (23, 78))
```

```
In [17]: tup4[:5]
```

```
Out[17]: (45, 2.6, 'sneha', (4+3j), [2, 3, 'hi'])
```

```
In [18]: tup4[2:]
```

```
Out[18]: ('sneha', (4+3j), [2, 3, 'hi'], (23, 78))
```

```
In [19]: tup4[2:7:2]
```

```
Out[19]: ('sneha', [2, 3, 'hi'])
```

```
In [24]: tup4[::-1]
```

```
Out[24]: ((23, 78), [2, 3, 'hi'], (4+3j), 'sneha', 2.6, 45)
```

```
In [25]: tup4[::-1]
```

```
Out[25]: (45, 2.6, 'sneha', (4+3j), [2, 3, 'hi'], (23, 78))
```

```
In [26]: tup4[5:6:]
```

```
Out[26]: ((23, 78),)
```

```
In [27]: tup4[2:8:-2]
```

```
Out[27]: ()
```

```
In [28]: tup4[::-3]
```

```
Out[28]: ((23, 78), 'sneha')
```

```
In [29]: tup4[0:10:2]
```

```
Out[29]: (45, 'sneha', [2, 3, 'hi'])
```

# loop in tuple

```
In [31]: for i in tup4:  
         print(i)
```

```
45  
2.6  
sneha  
(4+3j)  
[2, 3, 'hi']  
(23, 78)
```

## range()

```
In [34]: range()
```

```
-----  
TypeError                                Traceback (most recent call last)  
Cell In[34], line 1  
----> 1 range()  
  
TypeError: range expected at least 1 argument, got 0
```

```
In [37]: range(5,50)
```

```
Out[37]: range(5, 50)
```

```
In [40]: list(range(5))
```

```
Out[40]: [0, 1, 2, 3, 4]
```

```
In [41]: list(range(10,50,10))
```

```
Out[41]: [10, 20, 30, 40]
```

```
In [42]: tuple(range(10,50,10))
```

```
Out[42]: (10, 20, 30, 40)
```

```
In [43]: float(range(10,50,10))
```

```
-----  
TypeError                                Traceback (most recent call last)  
Cell In[43], line 1  
----> 1 float(range(10,50,10))  
  
TypeError: float() argument must be a string or a real number, not 'range'
```

```
In [44]: int(range(10,50,10))
```

-----  
**TypeError**

Traceback (most recent call last)

Cell In[44], line 1

----> 1 int(range(10,50,10))

**TypeError:** int() argument must be a string, a bytes-like object or a real number, not 'range'

In [32]: **for** i **in** range(0,10):  
          print(i)

0  
1  
2  
3  
4  
5  
6  
7  
8  
9