Day 17: Tuples

- There are 4 built-in data types in Python used to store collections of data:
  1. List
  2. Tuple
  3. Set
  4. Dictionary

Tuples

- Tuples are used to store multiple items in a single variable.
- A tuple is a collection which is ordered, unchangeable and allows duplicates.
- Tuples are written with round brackets.

```
thistuple = ("apple", "banana", "cherry")
print(thistuple)
print(type(thistuple))
```

- Tuple specifications:
  - Ordered - It means that items have defined order, and that order will not change.
  - Unchangeable - It means we cannot change, add or remove items after tuple has been created.
  - Allows Duplicates -

    ```
    # duplicates
    thistuple = ("apple", "banana", "cherry", "apple", "cherry")
    print(thistuple)
    ```

Tuple Length

```
thistuple = ("apple", "banana", "cherry")
print(len(thistuple))
```

Create tuple with one item

```
thistuple = ("apple",) # have to add comma here
print(type(thistuple))

#NOT a tuple
thistuple = ("apple")
print(type(thistuple))
```

Tuple Items - Data Types

A tuple can contain different data types:

```
tuple1 = ("apple", "banana", "cherry")
tuple2 = (1, 5, 7, 9, 3)
tuple3 = (True, False, False)

print(tuple1)
print(tuple2)
print(tuple3)

tuple1 = ("abc", 34, True, 40, "male")
print(tuple1)
```

Access Tuple Items

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

# negative indexing
thistuple = ("apple", "banana", "cherry")
```

```
print(thistuple[-1])

# range of indexes
thistuple = ("apple", "banana", "cherry", "orange", "kiwi", "melon", "mango")
print(thistuple[2:5])

# range of negative indexes
thistuple = ("apple", "banana", "cherry", "orange", "kiwi", "melon", "mango")
print(thistuple[-4:-1])
```

Update Tuples

- Once a tuple is created, you cannot change its values. Tuples are **unchangeable**, or **immutable** as it also is called.
- But there is a workaround. You can convert the tuple into a list, change the list, and convert the list back into a tuple.

```
thistuple = ("apple", "banana", "cherry", "orange", "kiwi", "melon", "mango")

thistuple[1] = "mango"
# this will return error

thatlist = list(thistuple)
thatlist[1] = "mango"
thistuple = tuple(thatlist)

print(thistuple)
```

Add Items

- Adding items to tuples is not allowed, hence no append() method.
- However, You are allowed to add tuples to tuples, so if you want to add one item, (or many), create a new tuple with the item(s), and add it to the existing tuple:

```
thistuple = ("apple", "banana", "cherry")
thatlist = ("orange",)
thistuple += thatlist

print(thistuple)
```

Remove Items

- Tuples are **unchangeable**, so you cannot remove items from it, but you can use the same workaround as we used for changing and adding tuple items:

```
thistuple = ("apple", "banana", "cherry")
thatlist = list(thistuple)
thatlist.remove("apple")
thistuple = tuple(thatlist )
```