DAY-6 TUPLES

Tuples

A tuple is a collection of different data types which is ordered and unchangeable (immutable). Tuples are written with round brackets, (). Once a tuple is created, we cannot change its values. We cannot use add, insert, remove methods in a tuple because it is not modifiable (mutable). Unlike list, tuple has few methods. Methods related to tuples:

- tuple(): to create an empty tuple
- count(): to count the number of a specified item in a tuple
- index(): to find the index of a specified item in a tuple
- operator: to join two or more tuples and to create a new tuple

Creating a Tuple

- Empty tuple: Creating an empty tuple

```
# syntax
empty_tuple = ()
# or using the tuple constructor
empty_tuple = tuple()
```

- Tuple with initial values

```
# syntax
tpl = ('item1', 'item2','item3')
fruits = ('banana', 'orange', 'mango', 'lemon')
```

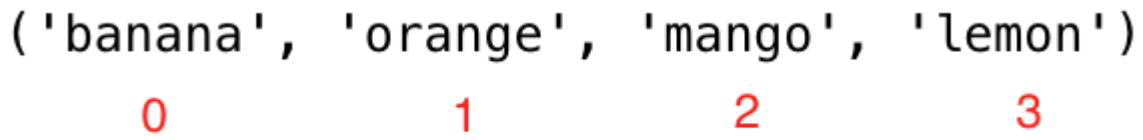
Tuple length

We use the *len()* method to get the length of a tuple.

```
# syntax
tpl = ('item1', 'item2', 'item3')
len(tpl)
```

Accessing Tuple Items

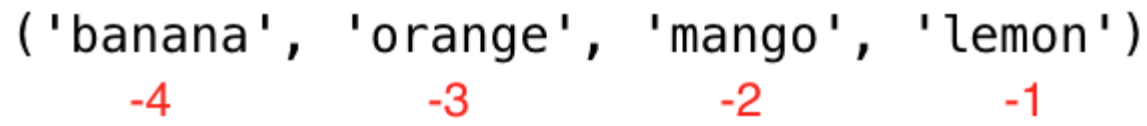
- Positive Indexing Similar to the list data type we use positive or negative indexing to access tuple
  items.




```
# Syntax
tpl = ('item1', 'item2', 'item3')
first_item = tpl[0]
second_item = tpl[1]

fruits = ('banana', 'orange', 'mango', 'lemon')
first_fruit = fruits[0]
second_fruit = fruits[1]
last_index =len(fruits) - 1
last_fruit = fruits[las_index]
```

- Negative indexing Negative indexing means beginning from the end, -1 refers to the last item, -2 refers to the second last and the negative of the list/tuple length refers to the first
  item.




```
# Syntax
tpl = ('item1', 'item2', 'item3','item4')
first_item = tpl[-4]
second_item = tpl[-3]

fruits = ('banana', 'orange', 'mango', 'lemon')
first_fruit = fruits[-4]
second_fruit = fruits[-3]
last_fruit = fruits[-1]
```

Slicing tuples

We can slice out a sub-tuple by specifying a range of indexes where to start and where to end in the tuple, the return value will be a new tuple with the specified items.

- Range of Positive Indexes

```
# Syntax
tpl = ('item1', 'item2', 'item3','item4')
all_items = tpl[0:4]          # all items
all_items = tpl[0:]          # all items
middle_two_items = tpl[1:3]  # does not include item at index
3
```

```
fruits = ('banana', 'orange', 'mango', 'lemon')
all_fruits = fruits[0:4]    # all items
all_fruits= fruits[0:]      # all items
orange_mango = fruits[1:3]  # doesn't include item at index 3
orange_to_the_rest = fruits[1:]
```

- Range of Negative Indexes

```
# Syntax
tpl = ('item1', 'item2', 'item3','item4')
all_items = tpl[-4:]          # all items
middle_two_items = tpl[-3:-1]  # does not include item at
index 3 (-1)

fruits = ('banana', 'orange', 'mango', 'lemon')
all_fruits = fruits[-4:]    # all items
orange_mango = fruits[-3:-1]  # doesn't include item at index
3
orange_to_the_rest = fruits[-3:]
```

Changing Tuples to Lists

We can change tuples to lists and lists to tuples. Tuple is immutable if we want to modify a tuple we should change it to a list.

```
# Syntax
tpl = ('item1', 'item2', 'item3','item4')
lst = list(tpl)
```

```
fruits = ('banana', 'orange', 'mango', 'lemon')
fruits = list(fruits)
fruits[0] = 'apple'
print(fruits)     # ['apple', 'orange', 'mango', 'lemon']
fruits = tuple(fruits)
print(fruits)     # ('apple', 'orange', 'mango', 'lemon')
```

Checking an Item in a Tuple

We can check if an item exists or not in a tuple using *in*, it returns a boolean.

```
# Syntax
tpl = ('item1', 'item2', 'item3','item4')
'item2' in tpl # True
```

```
fruits = ('banana', 'orange', 'mango', 'lemon')
print('orange' in fruits) # True
print('apple' in fruits) # False
fruits[0] = 'apple' # TypeError: 'tuple' object does not
support item assignment
```

Joining Tuples

We can join two or more tuples using + operator

```
# syntax
tpl1 = ('item1', 'item2', 'item3')
tpl2 = ('item4', 'item5','item6')
tpl3 = tpl1 + tpl2
```

```
fruits = ('banana', 'orange', 'mango', 'lemon')
vegetables = ('Tomato', 'Potato', 'Cabbage','Onion', 'Carrot')
fruits_and_vegetables = fruits + vegetables
```

Deleting Tuples

It is not possible to remove a single item in a tuple but it is possible to delete the tuple itself using *del*.

```
# syntax
tpl1 = ('item1', 'item2', 'item3')
del tpl1

fruits = ('banana', 'orange', 'mango', 'lemon')
del fruits
```

You are so brave, you made it to this far. You have just completed day 6 challenges and you are 6 steps a head in to your way to greatness. Now do some exercises for your brain and for your muscle.

💻 Exercises: Day 6

Exercises: Level 1

1. Create an empty tuple
2. Create a tuple containing names of your sisters and your brothers (imaginary siblings are fine)
3. Join brothers and sisters tuples and assign it to siblings
4. How many siblings do you have?
5. Modify the siblings tuple and add the name of your father and mother and assign it to family_members

Exercises: Level 2

1. Unpack siblings and parents from family_members
2. Create fruits, vegetables and animal products tuples. Join the three tuples and assign it to a variable called food_stuff_tp.
3. Change the about food_stuff_tp tuple to a food_stuff_lt list
4. Slice out the middle item or items from the food_stuff_tp tuple or food_stuff_lt list.
5. Slice out the first three items and the last three items from food_staff_lt list
6. Delete the food_staff_tp tuple completely
7. Check if an item exists in tuple:

- Check if 'Estonia' is a nordic country
- Check if 'Iceland' is a nordic country

```
nordic_countries = ('Denmark', 'Finland','Iceland', 'Norway', 'Sweden')
```