Sprint 2_Data Structure

June 7, 2022

1 IT Academy - Data Science

1.1 S02 T01: Estructura de dades

1.1.1 *Exercise 1*

Create a list that groups the months of the year into quarters (Q1: January, February and March, Q2: April, May, June …), that is, a list with 4 lists inside.

```python
[30]: quarter1 = ["January", "February", "March"]
quarter2 = ["April", "May", "June"]
quarter3 = ["July", "August", "September"]
quarter4 = ["October", "November", "December"]
yearByQuarters = quarter1 + quarter2 + quarter3 +quarter4

for x in yearByQuarters:
  print(x)
```

```
January
February
March
April
May
June
July
August
September
October
November
December
```

1.1.2 *Exercise 2*

Create a code that accesses to: - The second month of the first quarter

```python
[6]: print(quarter1[1])
```

```
February
```

- The months of the first quarter

```
[31]: for x in quarter1:
          print(x)
```

```
January
February
March
```

- September and October

```
[32]: for x in yearByQuarters[8:10]:
          print(x)
```

```
September
October
```

1.1.3 Exercise 3

Create a list of unordered numbers

```
[33]: #import numpy library
      import numpy as np

      #create random array of 10 elements, with range from 1 to 10
      a = np.random.randint(1, 10, 10)
      mylist = a.tolist()
      print (mylist)
```

```
[3, 4, 3, 1, 5, 9, 6, 9, 4, 6]
```

and answer the following questions - How many numbers are in the list?

```
[34]: print("This list has", len(mylist), "elements.")
```

```
This list has 10 elements.
```

- How often does number 3 appear?

```
[35]: print("Number 3 counts", mylist.count(3), "times.")
```

```
Number 3 counts 2 times.
```

- How often do numbers 3 and 4 appear?

```
[36]: print("Number 3 and 4 count", mylist.count(3)+mylist.count(4), "times.")
```

```
Number 3 and 4 count 4 times.
```

- What is the largest number?

```
[37]: print("Number", max(mylist), "is the largest of this list.")
```

```
Number 9 is the largest of this list.
```

- What are the 3 smallest numbers?

```
[38]: mylist.sort()
      uniquesElements = list(set(mylist))
      print("Three smallest elements of this list are:", *uniquesElements[:3])
```

Three smallest elements of this list are: 1 3 4

- What is the range of this list?

```
[39]: print("The range of this list is:", max(mylist)-min(mylist))
```

The range of this list is: 8

1.1.4 *Exercise 4*

Create a dictionary as follows:

```
[40]: compra = { "Pomes" : {"Qty": 5, "€": 0.42}, "Peres" : {"Qty": 3, "€": 0.66} }
```

and answer the questions: - Add more fruits

```
[41]: compra.update({"Kiwis" : {"Qty": 3, "€": 0.89}})
      compra.update({"Bananas" : {"Qty": 6, "€": 0.51}})
      print("Shopping list:", compra)
```

Shopping list: {'Pomes': {'Qty': 5, '€': 0.42}, 'Peres': {'Qty': 3, '€': 0.66},
'Kiwis': {'Qty': 3, '€': 0.89}, 'Bananas': {'Qty': 6, '€': 0.51}}

- How much did the pears cost in total?

```
[42]: # cost of pears: number of pears * unit price
      pearPrice = compra["Peres"]["Qty"] * compra["Peres"]["€"]
      print("Total cost of pears in euro is:", pearPrice)
```

Total cost of pears in euro is: 1.98

- How many fruits did we buy in total?

```
[43]: fruits = 0
      for x in compra.keys():
          fruits  += compra[x]["Qty"]
      print("Total fruits bought:",fruits)
```

Total fruits bought: 17

- What is the most expensive fruit?

```
[44]: #create dictonary of fruits and prices
      fruitPrice = {}
      for x, value in compra.items():
          fruitPrice[x] = value['€']
```

```python
print("Unit price of fruits:", fruitPrice)

#get maximum value of unit prices
maxFruitCost = max(fruitPrice.values())

#create list of fruits and prices
fruits = list(fruitPrice.keys())
prices = list(fruitPrice.values())

#index highest price from list prices to match with index of fruits
i = prices.index(maxFruitCost)
print("Fruit with highest price per piece: {}".format(fruits[i]))
```

```
Unit price of fruits: {'Pomes': 0.42, 'Peres': 0.66, 'Kiwis': 0.89, 'Bananas':
0.51}
Fruit with highest price per piece: Kiwis
```