Tasca2_Sprint3_Data_Structures

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1 *Tasca 2, Sprint 3 Data Structures*

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.

```
In [1]: q1 = ['January', 'February', 'March']
        q2 = ['April', 'May', 'June']
        q3 = ['July', 'August', 'September']
        q4 = ['October', 'November', 'December']

In [2]: months = [q1, q2, q3, q4]
        months

Out[2]: [['January', 'February', 'March'],
         ['April', 'May', 'June'],
         ['July', 'August', 'September'],
         ['October', 'November', 'December']]
```

1.2 Exercise 2

Create a code that allows you to access:

```
The second month of the first quarter
The months of the first quarter
September and October
```

```
In [3]: t1 = q1[1]
        print('The second month of the first quarter is: ' + t1)

The second month of the first quarter is: February
```

```
In [4]: t2 = q1
        print('The months of the first quarter are: ' + t2[0] + ', ' + t2[1] + ' and ' + t2[2]

The months of the first quarter are: January, February and March
```

```
In [5]: t3 = [q3[2], q4[0]]
        print(t3[0] + ' and ' + t3[1])
```

```
September and October
```

1.3 Exercise 3

Create a list of disordered numbers and answer the following questions:

1. How many numbers are there?
2. How many times does the number 3 appear
3. How many times do the numbers 3 and 4 appear?
4. What is the largest number?
5. What are the 3 smallest numbers?
6. What is the range of this list?

```
In [6]: import random
        random.seed(15)
        numbers = random.sample(range(1, 50), 20)
        print(numbers)
```

```
[14, 1, 34, 3, 11, 16, 2, 4, 10, 24, 44, 8, 22, 30, 23, 18, 26, 17, 12, 38]
```

```
In [7]: print ('Total numbers: ' + str(len(numbers)))
        print ('Number 3: ' + str(numbers.count(3)))
        print ('Number 3 and 4: ' + str(numbers.count(3)) + ' and ' + str(numbers.count(3)))
        print ('The largest number: ' + str(max(numbers)))
        print ('The 3 smallest numbers: ' + str(sorted(numbers)[:3]))
        print ('The range of the list: ' + str(min(numbers)) + ' to ' + str(max(numbers)))
```

```
Total numbers: 20
Number 3: 1
Number 3 and 4: 1 and 1
The largest number: 44
The 3 smallest numbers: [1, 2, 3]
The range of the list: 1 to 44
```

Answers to the questions for Excercise 3:

1. There are 20 numbers in the list
2. Number 3 appears 1 times
3. Number 3 and 4 appears 1 and 1 times
4. The largest number is 44
5. The 3 smallest numbers are 1, 2, and 3
6. The range of the list is [1, 44]

1.4 Exercise 4

Create a dictionary as follows and answer the questions:
purchase = {"Apples": {"Qty": 5, "€": 0.42}, "Pears": {"Qty": 3, "€": 0.66}}

```
1. Add some more fruit
2. How much did the pears cost in total?
3. How many fruits did we buy in total?
4. What is the most expensive fruit?
```

```
In [8]: purchase = {"Apples": {"Qty": 5, "": 0.42}, "Pears": {"Qty": 3, "": 0.66}, "Bananas": {
        purchase
```

```
Out[8]: {'Apples': {'Qty': 5, '': 0.42},
         'Pears': {'Qty': 3, '': 0.66},
         'Bananas': {'Qty': 7, '': 0.36},
         'Peaches': {'Qty': 2, '': 0.76},
         'Mangoes': {'Qty': 2, '': 1.58},
         'Pineapples': {'Qty': 0, '': 1.38}}
```

```
In [9]: fruit = "Pears" # fruit for which we want to know the total cost
        cost_fruit = purchase[fruit]["Qty"] * purchase[fruit][""]
        print('Total cost of ' + fruit + ': ' + str(cost_fruit))
```

```
Total cost of Pears: 1.98
```

```
In [10]: # Let's get the list of fruits in the purchase list
         fruitlist = []
         fruitlist = [item[:] for item in purchase]
         print(fruitlist)

         # The following calculates the quantity of each fruit in the list and adds them
         totalfruits = 0
         for fruit in fruitlist:
             totalfruits = totalfruits + purchase[fruit]["Qty"]
             print(fruit + ': ' + str(purchase[fruit]["Qty"]))

         print('Fruits bought in total: ' + str(totalfruits))
```

```
['Apples', 'Pears', 'Bananas', 'Peaches', 'Mangoes', 'Pineapples']
Apples: 5
Pears: 3
Bananas: 7
Peaches: 2
Mangoes: 2
Pineapples: 0
Fruits bought in total: 19
```

```
In [11]: price = []
         for fruit in fruitlist:
             cost = [purchase[fruit][""]]
             #print(cost)
             price.append(cost)
         print(price)
```

```
[[0.42], [0.66], [0.36], [0.76], [1.58], [1.38]]
```

```
In [12]: x = max(price)
         for fruit in fruitlist:
             if x[0] == purchase[fruit][""]:
                 print('Expensive fruit: ' + fruit)
```

```
Expensive fruit: Mangoes
```

Answers to the questions for Excercise 4:

1. Added Bananas, Peaches, Mangoes and Pineapples.
2. Pears cost 1.98 in total.
3. We bought 19 fruits in total.
4. The most expensive fruit is Mango.