Sprint 2_Control Structure

June 7, 2022

1 IT Academy - Data Science

1.1 S02 T03: Estructura de control

1.1.1 *Exercise 1*

Create a program that rates a numeric variable based on the Suspended / Passed / Notable / Excellent evaluation scale.

[24]:
```
def giveEvaluation(mark):
    if (mark < 5) & (mark >= 0):
        evaluation = "Student suspended"
    elif (mark < 7) & (mark >= 5):
        evaluation = "Student passed"
    elif (mark < 9) & (mark >= 7):
        evaluation = "Student was notable"
    elif (mark <= 10) & (mark >= 9):
        evaluation = "Student was excellent"
    else: evaluation = "Mark not correct"
    return (evaluation)

x = float(input("Enter student mark: "))
giveEvaluation(x)
```

```
Enter student mark: 6
```

[24]:
```
'Student passed'
```

1.1.2 *Exercise 2*

Create a program that asks for two numbers. It should show a message saying if the first one is bigger, the second one is bigger or the same.

[26]:
```
def greaterNumber (num1, num2):
    if (num1>num2): print (num1, "is bigger than", num2)
    elif (num1<num2): print (num2, "is bigger than", num1)
    else: print ("Inputs entered are equal numbers.")
```

```
num1 = float(input("Enter one number: "))
num2 = float(input("Enter another number: "))

greaterNumber(num1, num2)
```

```
Enter one number: 36.4
Enter another number: 49
49.0 is bigger than 36.4
```

1.1.3 *Exercise 3*

Create a program that asks for the name, and asks for a number. If the number is 0, it should display an error message. Otherwise, it should show the repeated name as many times as the number indicates. For example, "Joan Joan Joan".

[27]:
```
def repeatName (name, num):
    if (num == 0): print("Input zero not valid.")
    else:
        print("Your repeated name:")
        for x in range(num):
            print(name)

name = input("Enter your name: ")
num = int(input("Enter one number: "))

repeatName (name, num)
```

```
Enter your name: Giorgia
Enter one number: 4
Your repeated name:
Giorgia
Giorgia
Giorgia
Giorgia
```

1.1.4 *Exercise 4*

Create a program that, given any list, tells if it is symmetrical or not. If so, let me tell you how many items it has.

[28]:
```
def isSymmetric(mat, N):
    for i in range(N):
        for j in range(N):
            if (mat[i][j] != mat[j][i]):
                return False
    return True
```

[29]:
```
# List with integers
mylist1 = [ [ 1, 3, 5 ],
            [ 3, 2, 4 ],
            [ 5, 4, 1 ] ]

# Get number of elements of list
size = 1
for dim in np.shape(mylist1): size *= dim

# Check if list is symmetric
if (isSymmetric(mylist1, 3)):
    print("The list is symmetric and it has",size, "elements")
else:
    print ("The list is not symmetric.")
```

```
The list is symmetric and it has 9 elements
```

[30]:
```
# List with strings
mylist2 = ([["cat", "dog", "fish"],
              ["dog", "dog", "fish"],
              ["fish", "fish", "cat"]])

# Get number of elements of list
size = 1
for dim in np.shape(mylist1): size *= dim

# Check if list is symmetric
if (isSymmetric(mylist2, 3)):
    print("The list is symmetric and it has",size, "elements")
else:
    print ("The list is not symmetric.")
```

```
The list is symmetric and it has 9 elements
```

[31]:
```
# List not symmetric with integers
mylist3 = [ [ 1, 8, 5 ],
            [ 4, 4, 4 ],
            [ 5, 4, 1 ] ]

# Get number of elements of list
size = 1
for dim in np.shape(mylist3): size *= dim

# Check if list is symmetric
if (isSymmetric(mylist3, 3)):
    print("The list is symmetric and it has",size, "elements")
else:
```

```
    print ("The list is not symmetric.")
```

```
The list is not symmetric.
```

1.1.5 *Exercise 5*

Create a program that, given a list, tells you how many numbers match position. For example [3,4,2,0,2,3,6] 2 and 6 coincide.

[37]:
```
def valueIndex(v):
    match = []
    for i in range(len(v)):
        if v[i] == i: match.append(i)
    if len(match) == 0: print("No values match with index")
    else: print("Matches of values and indexes of the following numbers:",␣
 ↪match)
```

[38]:
```
#list from example
list1 = [3,4,2,0,2,3,6]
print(list1)

#check if values of the list coincide with index of the list
valueIndex(list1)
```

```
[3, 4, 2, 0, 2, 3, 6]
Matches of values and indexes of the following numbers: [2, 6]
```

[39]:
```
#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)
list2 = a.tolist()
print (list2)
```

```
[5, 4, 1, 8, 5, 9, 4, 7, 5, 3]
```

[40]:
```
#check if values of the list coincide with index of the list
valueIndex(list2)
```

```
Matches of values and indexes of the following numbers: [7]
```