CMM201_Week5_lab_solved

October 4, 2019

1 Week 5 Laboratory

In this Jupyter notebook, you modify your "Main Menu" created on the last session so that it works with functions. Moreover, you will include a new option to use the *accumulate()* function seen in the lecture. Finally, you will develop a method to link the output of one function with the input of another, verifying that the execution order is correct.

First, test my or your main menu to see that it is working correctly:

In [1]:
```
## The main menu from last week (my version, feel free to use your own!)

x = True
while x:
    print('Welcome to my menu. Select an option (1,2,3):')
    x = input()
    if x == '1':
        print('Insert a number')
        n = input()
        print('The multiples are:')
        for a in list(range(1,11)):
            print(a*int(n))
    elif x == '2':
        print('Enter your name')
        name = input()
        ans = True
        while ans:
            print('Is it raining?')
            y = input()
            if y.lower() == 'yes':
                print(name+", let's go to the library.")
                ans = False
            elif y.lower() == 'no':
                print(name+", let's go to the beach.")
                ans = False
            else:
                print('Wrong option. Please try again.')
    elif x == '3':
        print('Exiting the program')
```

```
            x = False
        else:
            print('Wrong option. Please try again.')
```

```
Welcome to my menu. Select an option (1,2,3):
4
Wrong option. Please try again.
Welcome to my menu. Select an option (1,2,3):
1
Insert a number
5
The multiples are:
5
10
15
20
25
30
35
40
45
50
Welcome to my menu. Select an option (1,2,3):
2
Enter your name
Carlos
Is it raining?
yes
Carlos, let's go to the library.
Welcome to my menu. Select an option (1,2,3):
3
Exiting the program
```

1.1 Main menu with functions

The first thing you will do is set three cells for functions *option1, option2* and *option3*:

```
In [4]: def option1(n):
            '''This function corresponds to option 1 (a list of the first ten multiples of a n
            multiples = []
            print('The multiples are:')
            for a in list(range(1,11)):
                print(a*int(n))
                multiples.append(a*int(n))
            return multiples
```

```
In [5]: def option2(name):
            '''This function corresponds to option 2 (library/beach).'''
```

```
        ans = True
        while ans:
            print('Is it raining?')
            y = input()
            if y.lower() == 'yes':
                print(name+", let's go to the library.")
                ans = False
            elif y.lower() == 'no':
                print(name+", let's go to the beach.")
                ans = False
            else:
                print('Wrong option. Please try again.')
        return
```

```
In [6]: def accumulate(numbers, acc=0):
            '''This function corresponds to the accumulator.'''
            print('The list of numbers is,',numbers)
            for n in numbers:
                acc = acc + n
                print('The accumulated value is', acc)
            return acc
```

Then, we need to modify the main menu from last week and see how we can migrate the contents from each option to its respective function. Consider the following: 1. Remember that the accumulator function uses a list as its first input. How can we input a list into python? Can we use the *input()* function? 2. The second input of the *accumulate()* function is *acc*, which is the value of the accumulator. If option 3 is executed the first time, then the value of *acc* should start as 0, but if it is run a second time, then the function has to use the existing *acc* value!

```
In [8]: ## The new main menu, now with four options

        acc = 0
        x = True
        while x:
            print('Welcome to my menu. Select an option (1,2,3,4):')
            x = input()
            if x == '1':
                print('Insert a number:')
                n = input()
                multiples = option1(n)
            elif x == '2':
                print('Enter your name:')
                name = input()
                option2(name)
            elif x == '3':
                print('Enter a list to accumulate:')
                numbers = []
                m = int(input("Enter number of elements : "))
```

```
                for i in range(0, m):
                    ele = int(input())
                    numbers.append(ele)
                acc = accumulate(numbers, acc)
            elif x == '4':
                print('Exiting the program')
                x = False
            else:
                print('Wrong option. Please try again.')
```

```
Welcome to my menu. Select an option (1,2,3,4):
5
Wrong option. Please try again.
Welcome to my menu. Select an option (1,2,3,4):
1
Insert a number:
5
The multiples are:
5
10
15
20
25
30
35
40
45
50
Welcome to my menu. Select an option (1,2,3,4):
2
Enter your name:
Carlos
Is it raining?
no
Carlos, let's go to the beach.
Welcome to my menu. Select an option (1,2,3,4):
3
Enter a list to accumulate:
Enter number of elements : 4
1
2
3
4
The list of numbers is, [1, 2, 3, 4]
The accumulated value is 1
The accumulated value is 3
The accumulated value is 6
The accumulated value is 10
```

```
Welcome to my menu. Select an option (1,2,3,4):
3
Enter a list to accumulate:
Enter number of elements : 3
1
2
3
The list of numbers is, [1, 2, 3]
The accumulated value is 11
The accumulated value is 13
The accumulated value is 16
Welcome to my menu. Select an option (1,2,3,4):
4
Exiting the program
```

Once you have finished your implementation, run the program by executing the commands 5-1-2-3-3-4 in that order.

1.2 Linking functionas and verifying order

How can we modify the main menu so that the accumulator function (option 3) uses the numbers generated in option 1? For this, you need to consider two things: 1. Option 1 should output a list of numbers. 2. The program has to verify that option 3 cannot be selected unless option 1 is selected first!

In [10]:
```
## The new main menu, now linking the output of option 1 to option 3

acc = 0
options = []
x = True
while x:
    print('Welcome to my menu. Select an option (1,2,3,4):')
    x = input()
    options.append(x)
    if x == '1':
        print('Insert a number:')
        n = input()
        multiples = option1(n)
    elif x == '2':
        print('Enter your name:')
        name = input()
        option2(name)
    elif x == '3':
        if '1' in options:
            acc = accumulate(multiples, acc)
        else:
            print('Select option 1 first.')
```

```
            elif x == '4':
                print('Exiting the program')
                x = False
            else:
                print('Wrong option. Please try again.')
```

```
Welcome to my menu. Select an option (1,2,3,4):
5
Wrong option. Please try again.
Welcome to my menu. Select an option (1,2,3,4):
3
Select option 1 first.
Welcome to my menu. Select an option (1,2,3,4):
1
Insert a number:
3
The multiples are:
3
6
9
12
15
18
21
24
27
30
Welcome to my menu. Select an option (1,2,3,4):
2
Enter your name:
Carlos
Is it raining?
yes
Carlos, let's go to the library.
Welcome to my menu. Select an option (1,2,3,4):
3
The list of numbers is, [3, 6, 9, 12, 15, 18, 21, 24, 27, 30]
The accumulated value is 3
The accumulated value is 9
The accumulated value is 18
The accumulated value is 30
The accumulated value is 45
The accumulated value is 63
The accumulated value is 84
The accumulated value is 108
The accumulated value is 135
The accumulated value is 165
Welcome to my menu. Select an option (1,2,3,4):
```

```
3
The list of numbers is, [3, 6, 9, 12, 15, 18, 21, 24, 27, 30]
The accumulated value is 168
The accumulated value is 174
The accumulated value is 183
The accumulated value is 195
The accumulated value is 210
The accumulated value is 228
The accumulated value is 249
The accumulated value is 273
The accumulated value is 300
The accumulated value is 330
Welcome to my menu. Select an option (1,2,3,4):
4
Exiting the program
```

Once you have finished your implementation, run the program by executing the commands 5-3-1-2-3-3-4 in that order.