

Assignment

May 24, 2016

1 Week 3 Assignment

Except for the last question, homework for this week can be written inside of an ipython notebook file. Questions can be labelled accordingly.

1.1 If statements

The mythical island nation of Laskoatu has a rather simple tax code. The first \$1000 of income is taxed at 5%. The next \$1000 is taxed at 10%. Any income beyond the first \$2000 is taxed at 15%. Complete the following script so that it asks the user for his or her income and outputs the amount of tax owed.

```
In [2]: income = int(input("Please enter your income:"))
```

Please enter your income:5000

1.2 While loops

Write a script that prompts the user for his or her name. Using a while loop that counts downwards, print the name with the letters reversed. You may use `s.lower()` and `s.upper()` to change a string `s` to lowercase and uppercase letters.

Enter your name: Paul
Luap

If the name is the same forward and backwards, print "Palindrome!" on the next line.

Enter your name: Ana
Ana
Palindrome!

```
In [ ]: name = input("Enter your name: ")
```

1.3 Tree Prints

Write a script that prompts the user for an integer tree size, then displays a number tree as shown below:
Enter a size: 5

```
1
121
12321
1234321
123454321
```

```
In [ ]: n = int(input("Enter a size: "))
```

1.4 Fibonacci

The Fibonacci numbers begin with 1, 1. After the first two numbers, each number is the sum of the previous two. $1 + 1 = 2$, so 2 is the third number. Then $1 + 2 = 3$, so 3 is the next one, and so on. Write a script that prompts the user for a number, then prints all the Fibonacci numbers that are less than or equal to the input, in order.

```
Enter a number: 15
1 1 2 3 5 8 13
```

```
In [ ]: n = int(input("Enter a number: "))
```

1.5 Pascal's Triangle

Pascal's triangle is a triangle of numbers that is computed as follows. The first row contains a 1. Each row after that begins and ends with a 1, and every other number is the sum of the two numbers above it. The first six rows of Pascal's triangle are shown below.

```
      1
     1 1
    1 2 1
   1 3 3 1
  1 4 6 4 1
 1 5 10 10 5 1
```

Write a script to compute the nth row of Pascal's triangle.

```
In [ ]: n = int(input("Enter a number: "))
```

1.6 Code Refactoring

Improve the readability of the code below by removing the inner while loop and replacing with another control structure. The output your code produces should be exactly the same as the original.

```
In [ ]: # set the index and limit variables
        index = -20
        limit = 20

        # loop until limit
        while index <= limit:
            print("index is now: ", index)
            index = index + 1
            # CODE CHANGE: Remove this inner while loop and replace with another control structure
            while index <= 0:
                print("index is negative")
                index = index + 1
```

1.7 Create a to-do list using a dictionary of lists

Your program should have the following elements:

1. Empty dictionary to store information
2. Key for each day of the week
3. Each key has a list value that stores items
4. User is prompted to add to or view to-do list

5. User can type “add” program will ask what day and add it correctly
6. User can type “get” and the program will ask for the day and print the values

Example:

```
What would you like to do?
add
What day?
Friday
What would you like to add to Friday's to-do list?
practice clarinet
What would you like to do?
get
What day?
Friday
You have to practice clarinet.
What would you like to do?
```

1.8 Please submit feedback for any and all homeworks!

<http://goo.gl/forms/74yCiQTf6k>

In []: