Python Core Assignments -Week 4

Control Flow Statements (Conditional, Iterative, Transfer)

1. Print First 10 natural numbers using while loop

Expected output:

1
2
3
4
5
6
7
8
9
10

2. Print the following pattern

Write a program to print the following number pattern using a loop.

1
1 2
1 2 3
1 2 3 4
1 2 3 4 5

3. Calculate the sum of all numbers from 1 to a given number

Write a program to accept a number from a user and calculate the sum of all numbers from 1 to a given number

For example, if the user entered **10** the output should be **55 (1+2+3+4+5+6+7+8+9+10)**

Expected Output:

Enter number 10

Sum is: 55

4. Write a program to print multiplication table of a given number

For example, **num = 2** so the output should be

2
4
6
8
10
12
14
16
18
20

5. Display numbers from a list using loop

Write a program to display only those numbers from a list that satisfy the following conditions

- The number must be divisible by five
- If the number is greater than 150, then skip it and move to the next number
- If the number is greater than 500, then stop the loop

Given: numbers = [12, 75, 150, 180, 145, 525, 50]

Expected output:
75
150
145

6. Count the total number of digits in a number
Write a program to count the total number of digits in a number using a while loop.
For example, the number is **75869**, so the output should be **5**.

7. Print the following pattern

Write a program to use **for** loop to print the following reverse number pattern

5 4 3 2 1
4 3 2 1
3 2 1
2 1
1

8. Print list in reverse order using a loop

Given: list1 = [10, 20, 30, 40, 50]

Expected output:

50
40
30
20
10

9. Display numbers from -10 to -1 using for loop

Expected output:

-10
-9
-8
-7
-6
-5
-4
-3
-2
-1

10. Use else block to display a message "Done" after successful execution of for loop

For example, the following loop will execute without any error.

Given:

```
for i in range(5):
    print(i)
```

Expected output:

0
1
2
3
4
Done!

11. Write a program to display all prime numbers within a range

Note: A Prime Number is a number that cannot be made by multiplying other whole numbers. A prime number is a natural number greater than 1 that is not a product of two smaller natural numbers

Examples:

- **6** is not a prime number because it can be made by 2×3 = 6
- **37** is a prime number because no other whole numbers multiply together to make it.

Given:

```
# range
start = 25
end = 50
```

Expected output:

Prime numbers between 25 and 50 are:
29
31
37
41
43
47

12. Display Fibonacci series up to 10 terms

The Fibonacci Sequence is a series of numbers. The next number is found by adding up the two numbers before it. **The first two numbers are 0 and 1**.

For example, 0, 1, 1, 2, 3, 5, 8, 13, 21. The next number in this series above is 13+21 = 34.

Expected output:

Fibonacci sequence:
0 1 1 2 3 5 8 13 21 34

13. Find the factorial of a given number

Write a program to use the loop to find the factorial of a given number.

The factorial (symbol: **!**) means to multiply all whole numbers from the chosen number down to 1.

For example: calculate the factorial of 5

5! = 5 × 4 × 3 × 2 × 1 = 120

Expected output:
120

14. Reverse a given integer number

Given:
76542

Expected output:
24567

15. Use a loop to display elements from a given list present at odd index positions

Given:
my_list = [10, 20, 30, 40, 50, 60, 70, 80, 90, 100]

Note: list index always starts at 0

Expected Output: 20 40 60 80 100

16. Calculate the cube of all numbers from 1 to a given number

Write a program to print the cube of all numbers from 1 to a given number

Given: input_number = 6

Expected Output:

Current Number is: 1 and the cube is **1**
Current Number is: 2 and the cube is **8**
Current Number is: 3 and the cube is **27**
Current Number is: 4 and the cube is **64**
Current Number is: 5 and the cube is **125**
Current Number is: 6 and the cube is **216**

17. Find the sum of the series up to n terms

Write a program to calculate the sum of series up to n term.
For example, if **n =5** the series will become **2 + 22 + 222 + 2222 + 22222 = 24690**

Given:

```
# number of terms
n = 5
```

Expected output:
24690

18. Print the following pattern
Write a program to print the following start pattern using the for loop

```
*
* *
* * *
* * * *
* * * * *
* * * * * *
* * * * *
* * * *
* * *
* *
*
```

19. Check the number is positive, negative, and it even or odd using nested if in python

This code prompts the user to input a number and then checks if the number is greater than 0. If it is, the code checks if the number is **even** or **odd**. If the number is even, it prints **"The given number is positive and also even number"**, if the number is odd, it prints **"The given number is positive and also odd number"**. If the number is not greater than 0, the code checks if the number is equal to 0, if it is, it prints **"The given number is neutral"**. If the number is not greater than 0 and not equal to 0, it prints **"The given number is negative"**.

Expected Output:

Enter the number: 4
The given number is positive and even number

20. Reverse Pyramid of Numbers

Required Pattern:

1
2 1
3 2 1
4 3 2 1
5 4 3 2 1

Note: It is a downward increment pattern where numbers get increased in each iteration. At each row, the amount of number is equal to the current row number.

21. Square pattern with numbers

Required Pattern:

1 2 3 4 5
2 2 3 4 5
3 3 3 4 5
4 4 4 4 5
5 5 5 5 5

22. Multiplication table pattern

Required Pattern:

1
2 4
3 6 9
4 8 12 16
5 10 15 20 25
6 12 18 24 30 36
7 14 21 28 35 42 49
8 16 24 32 40 48 56 64

23. Downward half-Pyramid Pattern of Star

Required Pattern:

*** * * * ***
*** * * ***
*** * ***
*** ***
*****

24. Downward full Pyramid Pattern of star

Required Pattern:

```
* * * * * *
 * * * * *
  * * * *
   * * *
    * *
     *
```

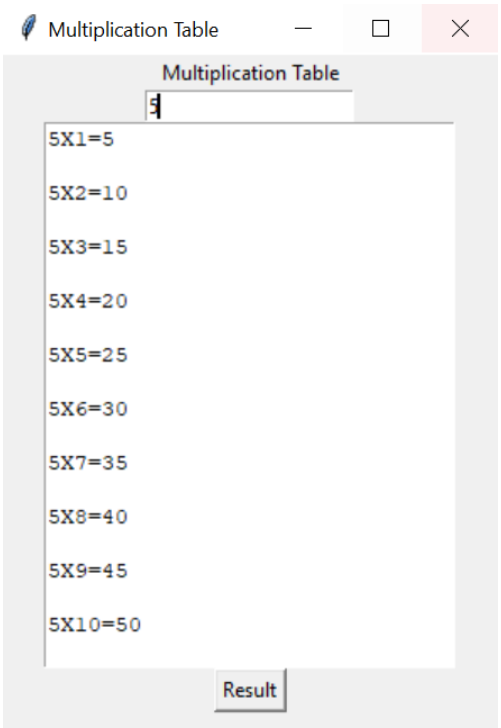
25. Print two pyramids of stars

Required Pattern:

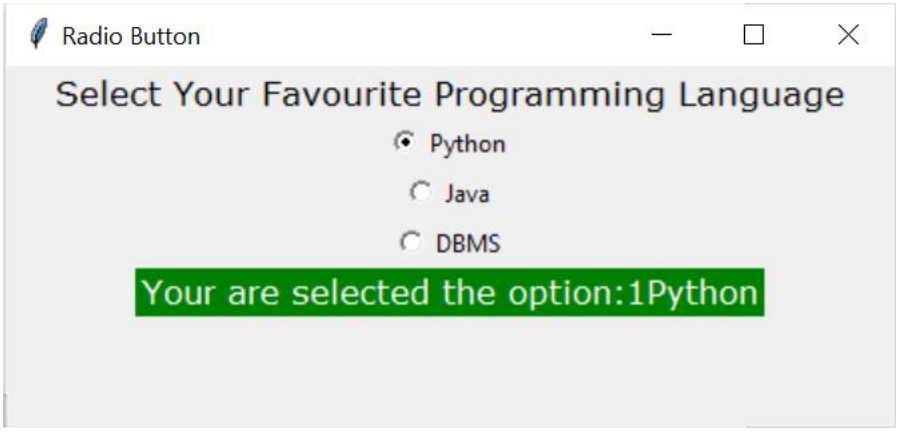
```
*
* *
* * *
* * * *
* * * * *
* * * *
* * *
* *
*
```

26. Python GUI Application Multiplication Table with the forward direction and reverse order.

Required Output:



27. Python GUI Application using the if condition as given below.



28. Python GUI Application of the calculate age as given below example: