Department of Computer Engineering
Department of Software Engineering
CENG113 / SENG113 - Computer Programming 1
Fall 2021 - 2022

Lab Guide #5 – Week 6

OBJECTIVE : Counter-controlled repetition, Sentinel-controlled repetition, Data validation,
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1. Given the **positive** number of terms and the value of x, display the result of the following series.

$$\frac{(x+0.1)}{2} - \frac{(x+0.2)^3}{4} + \frac{(x+0.3)^5}{6} - \frac{(x+0.4)^7}{8} + \ldots.$$

Project Name: LabGuide5_1
File Name: Question_1.cpp

Example Run:
```
Please enter the number of terms: -6
Please re-enter the number of terms: 0
Please re-enter the number of terms: 10
Please enter a value for x: 1.1
The result is -59783.61
```

2. In a country, there are three counties (eyalet) with different tax rates to be applied on any purchase, as shown in the table below. Write a program that displays the amount owed on a purchase, including sales tax, given the amount of the purchase and the type of the county. **Make data validation for County Type! Use Switch Statement.**

County	Tax Rate
A	7%
B	6%
C	4%

Project Name: LabGuide5_2
File Name: Question_2.cpp

Example Run#1:
```
Enter the amount of the purchase: 1500
Enter the county: Z
Enter the county: r
Enter the county: A
The amount owed is 1605.00
```

Example Run#2:
```
Enter the amount of the purchase: 2365
Enter the county: B
The amount owed is 2506.90
```

Example Run#3:
```
Enter the amount of the purchase: 4987
Enter the county: C
The amount owed is 5186.48
```

3. Write a program that displays a menu on the screen with the following options, and performs the required operation :

1. Triangular?
2. Prime?
3. EXIT

Program terminates when user enters 3. (Do not forget to make data validation for menu options)

- Triangular number is a number if and only if it is a sum of consecutive integers 1+2+3+…..
  For example:
  6 is a triangular number because it is the sum of 1+2+3;
  15 is a triangular number because it is the sum of 1+2+3+4+5.

- Prime number is a number whose divisors are only 1 and itself.

Project Name: LabGuide5_3
File Name: Question_3.cpp

Example Run:

```
MENU
-------
1. Triangular?
2. Prime?
3. Exit
Enter your choice:9
Wrong choice! Enter your choice again: -4
Wrong choice! Enter your choice again: 1
Enter a number: 6
6 is a triangular number

MENU
-------
1. Triangular?
2. Prime?
3. Exit
Enter your choice: 1

Enter a number: 20
20 is NOT triangular number
```

```
MENU
-------
1. Triangular?
2. Prime?
3. Exit
Enter your choice: 2

Enter a number: 45
45 is NOT a prime number

MENU
-------
1. Triangular?
2. Prime?
3. Exit
Enter your choice: 2

Enter a number: 7
7 is a prime number

MENU
-------
1. Triangular?
2. Prime?
3. Exit
Enter your choice: 3
```

4. Write a C program that will take a positive number as input, and output the digits of each given number in words and in reverse order. Your program must check for validity of the given input and then it must give an error message if the number is not a positive number.

Project Name: LabGuide5_4
File Name: Question_4.cpp

Example Run#1:

```
Enter a positive number: -5
Sorry! You didn't give a positive number!!!

Enter a positive number: 0
Sorry! You didn't give a positive number!!!

Enter a positive number: 36345
FIVE    FOUR    THREE   SIX     THREE
```

Example Run#2:

```
Enter a positive number: 65748
EIGHT   FOUR    SEVEN   FIVE    SIX
```

5. Modify the Question_4.cpp so the program will continue to run until the number 0 is given as input.

Project Name: LabGuide5_5
File Name: Question_5.cpp

Example Run:

```
Enter a positive number (0 to STOP): -6
Sorry! You didn't give a positive number!!!

Enter a positive number (0 to STOP): 415
FIVE    ONE     FOUR

Enter a positive number (0 to STOP): 67899
NINE    NINE    EIGHT   SEVEN   SIX

Enter a positive number (0 to STOP): 3274
FOUR    SEVEN   TWO     THREE

Enter a positive number (0 to STOP): -2
Sorry! You didn't give a positive number!!!

Enter a positive number (0 to STOP): 897
SEVEN   NINE    EIGHT

Enter a positive number (0 to STOP): 0
```