Department of Computer Engineering
Department of Software Engineering
CENG113 / SENG113 - Computer Programming 1
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Lab Guide #6 – Week 7

OBJECTIVE : Practice on nested loops and data validation, Void functions with no parameters.

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1. Write a C game program that allows a user to guess a number between 0 and 99. A while loop is appropriate since we know that winning the game always requires at least one guess. Your program should display a message whether the new guess must be above(up) or below(down) the old guess. (Use rand() function to be able to choose the asked number).

Example Run:

```
Make a Guess: 13
Wrong! Up Please!  New Guess: 44
Wrong! Down Please!  New Guess: 32
Yes this is the correct guess!  Thank you!
```

Project Name: LabGuide6
File Name: Question1.cpp

2. Write a program that takes several integers until a negative number is entered and displays those numbers based on the shape of a triangle, starting from 0 and continue until the entered number reached. (Similar to the ones in the example run)

Example Run #1:

```
Enter an integer (<0 to stop):0
0

Enter an integer (<0 to stop):7
0
01
012
0123
01234
012345
0123456
01234567

Enter an integer (<0 to stop):3
0
01
012
0123

Enter an integer (<0 to stop):-5
```

Project Name: LabGuide6_2
File Name: Question2.cpp

3. Write a C program that inputs positive integers until a non-positive integer is entered, and sums up the digits of each integer to reduce it to a new integer, repeating the process until only a single digit remains. **E.g:** if user enters 8974; 8974 reduces to 28, which reduces to 10, which reduces to 1.

Example Run:

```
Enter a positive integer (non-positive to exit): 16578
Sum of digits = 27
Sum of digits = 9

Enter a positive integer (non-positive to exit): 354789651
Sum of digits = 48
Sum of digits = 12
Sum of digits = 3

Enter a positive integer (non-positive to exit): -32
```

Project Name: LabGuide6_3
File Name: Question3.cpp

4. Write a function **void drawSquare(void)** that draws a 5x5 square with using '+' character; as shown in the example run below (leave one space between '+' characters). And call this function within your main().
You are supposed to use nested ***for*** loops inside the function.

Example Run #1:

```
Here is my 5x5 square:

+ + + + +
+ + + + +
+ + + + +
+ + + + +
+ + + + +
```

Project Name: LabGuide6_4
File Name: Question4.cpp

5. Write a program that allows a user to guess a number between 0 and 99. A do..while loop is appropriate since we know that winning the game always requires at least one guess. Your program should display a message whether the new guess must be above (up) or below (down) the old guess. (Use **rand()** function to be able to choose the asked number).

Example Run:

```
Enter a guess (between 0 and 99): -5
Your guess should be between 0 and 99. Enter a new guess: 110
Your guess should be between 0 and 99. Enter a new guess: 50
Wrong! Go Up!
Enter new guess (between 0 and 99): 100
Your guess should be between 0 and 99. Enter a new guess: 99
Wrong! Go Down!
Enter new guess (between 0 and 99): 75
Wrong! Go Up!
Enter new guess (between 0 and 99): 88
Wrong! Go Down!
Enter new guess (between 0 and 99): 80
Wrong! Go Down!
Enter new guess (between 0 and 99): 77
Congratulations!
```

Project Name: *LabGuide6_5*
File Name: Question5.*cpp*

6. Write a C program that displays the menu shown in the example run, to the user, with the operations following the menu selection. The menu will be shown continuously until such time that the user inputs 3 for exit.

- If anything but the exit (the 3rd) option is chosen, then the program will generate a random number between 3 and 9, and then use this number to determine how many rows of the triangle of choice to draw.
- If right triangle is chosen, then draw a triangle aligned to the right hand side, as shown in example run #1.
- If isosceles triangle is chosen, then draw a triangle as shown in the example run below, as shown in example run #2

Example Run #1:

```
        MENU
--------------------
1. Right Triangle
2. Isosceles Triangle
3. Exit
Enter your choice: 1
Random number is 7
      1
     21
    321
   4321
  54321
 654321
7654321
```

Example Run #2:

```
        MENU
--------------------
1. Right Triangle
2. Isosceles Triangle
3. Exit
Enter your choice: 2
Random number is 8
        1
       212
      32123
     4321234
    543212345
   65432123456
  7654321234567
876543212345678
```