

OBJECTIVES : Nested loops, Exercises.

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Q1. Write a C program that takes 5 different **x** values from the user, calculates the **f** function, and displays the results on the screen as in the example run. **Hint:** Use a switch statement to display the prompting message.

Project Name: LG9_Q1

FileName: Q1.cpp

$$f(x) = \begin{cases} 0 & \text{if } x \leq 0 \\ \frac{3}{\sqrt{x^3 + 1}} & \text{if } 0 < x \leq 10 \\ |x| + x^5 & \text{if } x > 10 \end{cases}$$

Example Run:

Enter first x value: 1
f(1.0) = 2.121

Enter second x value: 0
f(0.0) = 0.000

Enter third x value: -2
f(-2.0) = 0.000

Enter fourth x value: 2.2
f(2.2) = 0.879

Enter fifth x value: 11
f(11.0) = 161062.000

Q2. Write a C program that calculates the following series problem. Read and validate the value of **y** (it might cause division by 0) and calculate the value of **z**.

Project Name: LG9_Q2

File Name: Q2.cpp

$$z = -\frac{2!}{(y-2)^3} + \frac{4!}{(y-2)^5} - \frac{6!}{(y-2)^7} + \dots \dots \dots \frac{14!}{(y-2)^{15}}$$

Example Run:

Enter the value of y: 2
Division by zero!

Enter the value of y: 5.4

The result is -875.0529

Project Name: LG9_Q3
File Name: Q3.cpp

Example Run #2:

Randomly generated line number: 9

A
AB
ABC
ABCD
ABCDE
ABCDEF
ABCDEFG
ABCDEFGH
ABCDEFGHI

- 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 the right triangle is chosen, then draw a triangle aligned to the right-hand side, as shown in the example run.
- If isosceles triangle is chosen, then draw a triangle as shown in the example run below.

Project Name: LG9_Q4
File Name: Q4.cpp

[MENU](#)

```

            MENU
-----
1. Right Triangle
2. Isosceles Triangle
3. Exit
Enter your choice: 2
Random number is 3
    1
    212
32123

```

[MENU](#)

```
1. Right Triangle
2. Isosceles Triangle
3. Exit
Enter your choice: 3
```

ADDITIONAL QUESTIONS

AQ1. Write a C program that gets the side length of a rhombus in the range of 4 to 10 and gets a character until the character is '!', and draws that rhombus using the given character and displays it on the screen.

Project Name: LG9_AQ1

File Name: AQ1.cpp

Example Run:

```
Enter a character (! to stop): .
Enter the side length (4 - 10): 3
Enter the side length (4 - 10): 11
Enter the side length (4 - 10): 4
```

```
Enter a character (! to stop): #
Enter the side length (4 - 10): 7
```

```
Enter a character (! to stop): +
Enter the side length (4 - 10): 100
Enter the side length (4 - 10): 10
```

[illegible]

```
Enter a character (! to stop): !
```

AQ2. Write a C program, a number-guessing game that a user can play to guess a number between 20 and 70. Your program should generate a random number between 20 and 70 and request a user guess as an input to give directions for whether the guessed number is correct, or above or below the random number hidden from the user. The program counts and displays the number of valid guesses.

Project Name: LG9_AQ2

File Name: AQ2.cpp

Example Run:

```
Try to guess the number between 20 and 70.  
Enter your guess: 10  
Please enter a number between 20 and 70.  
Enter your guess: 80  
Please enter a number between 20 and 70.  
Enter your guess: 50  
Too low! Try again.  
Enter your guess: 60  
Congrats! You guessed the number correctly!  
It took you 2 attempt(s) to guess the correct number.
```

INSTRUCTIONS FOR UPLOADING YOUR ANSWERS:

1. **Make sure you have saved all your work** and exit from Microsoft Visual Studio 2017
2. Upon exit, if you hadn't saved already then Visual Studio will notify you to save it automatically; say **yes** to this.
3. Navigate into the directory in which you had created your lab guide solution and reverse click onto the **LG9_Sols** folder in there.
4. From the options menu, hover your mouse cursor over the **7-Zip** option and select "**Add to LG9_sols.zip**" option to archive and compress your solutions folder. Change the name of the resulting archive to your name and surname to the zip file, i.e. **NameSurname.zip**
5. Upload the zip file to the instructor's PC by using your preferred browser;
 - CTISL1: <http://lab1t>
 - CTISL2: <http://lab2t>
 - CTISL7: <http://lab7t>
6. Inform your assistant that you have completed the upload process.
7. After your assistant's **approval**, delete your files using the "**Clean**" module you can either find in your start menu, the C: drive root folder or download through <http://lab1t> for Lab1, <http://lab2t> for Lab2 and <http://lab7t> for Lab7.