

# National University of Computer and Emerging Sciences



## Laboratory Manual *for* Programming Fundamentals Lab

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Section	BCS-1K
Semester	Fall 2023

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### Objectives:

In this lab, students will practice:

1. Input/output function

2. Basic arithmetic operations
3. Escape sequences and datatypes precedence

#### Questions:

1. Write a program that shows output like

```
This is the output
This.  Is.   The.   Output.
This.
Is.
the
output
```

Hint: Use escape sequences.

2. Write a program that calculate the sum of two given numbers.
3. Write a program that takes two integer, divide them and store their result in float type variable.
4. Write a program that calculate the square of a given number.
5. Write a program that takes two values and swap them.
6. Implement a simple calculator that takes two value from user, perform basic arithmetic operations ( addition, subtraction, multiplication and division) and their result in the respective data type variables. Use proper statement for input, output.
7. Calculate the average of the five numbers.
8. Write a program that prints a table of "2".
9. Find area of circle using radius.
10. Write a program that shows whether the given number is even or odd.
11. Write a program that shows a given year is a leap year or not.
12. Write the output:

```
Int n=10;
cout<<" Here's a sequence\n";
cout<< n++ <<"\t" << n-- << "\t" << n << "\n";
cout<< ++n <<"\t" << --n << "\t" << n << "\n";
```

13. Create a C++ program that reads a character from the user and performs the following tasks:
  - Check if the character is uppercase or lowercase.
  - Convert the character to the opposite case.
  - Display the modified character.
14. Implement a C++ calculator program that takes an arithmetic expression as input (e.g., "5 + 2 \* 3") and evaluates it, considering operator precedence (multiplication and division before addition and subtraction).
15. Write a C++ program to calculate the area of a triangle using Heron's formula. The program should take the lengths of the three sides of the triangle as input and ensure that the user provides valid input.  
 Hero's formula for the area of a triangle with sides a, b, and c is as follows:  

$$\text{Area} = \sqrt{s * (s - a) * (s - b) * (s - c)}$$
 Where:
  - **s** is the semi-perimeter of the triangle, calculated as  $(a + b + c) / 2$ .