

National University of Computer and Emerging Sciences



**Laboratory Manual**  
*for*  
**Programming Fundamentals Lab**

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Section	BCS-1H1 & 1H2
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## Objectives

The objectives of this lab are to cover the following:

- Nested If
- Switch Statement
- While Loop

**Question 1:** Write a C+ program that read a character and check whether it is VOWEL or CONSONANT using Nested if. (5)

**Question 2:** Write a Calculator Program using the switch Statement. (5 marks)

**Question 3:** Let us see the C++ program to calculate the percentage of marks and show grade using the switch statements. (10 marks)

<p>Percentage <math>\geq 90\%</math>: Grade A</p> <p>Percentage <math>\geq 80\%</math>: Grade B</p> <p>Percentage <math>\geq 70\%</math>: Grade C</p> <p>Percentage <math>\geq 60\%</math>: Grade D</p> <p>Percentage <math>\geq 40\%</math>: Grade E</p> <p>Percentage <math>&lt; 40\%</math>: Grade F</p>
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**Question 4:** Write a program in C++ to find the sum of the series  $1 + 1/2^2 + 1/3^3 + \dots + 1/n^n$ . (10 marks)

**Sample Output:**

**Input the value for nth term: 5**

**$1/1^1 = 1$**

**$1/2^2 = 0.25$**

**$1/3^3 = 0.037037$**

**$1/4^4 = 0.00390625$**

**$1/5^5 = 0.00032$**

**The sum of the above series is: 1.29126**

**Hint:** For taking power, 2 steps are required in the code:

- Import the library by

`#include <cmath>`

- Syntax for power: `pow (base, exponent);`

**Question 5:** Write a program in C++ that prompts the user to enter two integers. The program must output how many numbers are multiples of 3 and how many are the multiples of 5 between the two integers. (10 marks)

**Question 6:** Write a program in C++ that will calculate the Sum of Positive Numbers only using while loop and the loop breaks when the user enters a negative value. (5 marks)

**Question 7:** Write a C++ program that generate Fibonacci sequence up to a certain number using while loop. (10 marks)

The Fibonacci sequence is a series where the next term is the sum of the previous two terms. The first two terms of the Fibonacci sequence is 0 followed by 1.

The Fibonacci sequence: 0, 1, 1, 2, 3, 5, 8, 13, 21

**Question 8:** Write a C++ program that check leap year using Nested If? (5 marks)

**Question 9:** Write a C++ program to print the right angled triangle star pattern using for loop. (10 marks)