

Himalaya College of Engineering

**Advanced C++ Programming Lab Report**

Lab 1: Quadratic Equations, Triangle Classification, and Password Strength Checking

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**Subject :** Object-Oriented Programming (OOP)

**Program :** Bachelor of Electronics, Communication and Information Engineering

**Institution :** Himalaya College of Engineering

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# Objectives

Understand and apply C++ control structures, functions, and standard libraries.

Implement mathematical computations using the quadratic formula.

Develop logic for triangle validation and classification.

Apply string handling and character checking for password strength.

Practice working with loops and conditions for prime number generation.

# Tools and Libraries Used

Programming Language: C++

IDE: Any C++ compiler (G++, Code::Blocks, etc.)

Libraries: #include <iostream>, #include <cmath>, #include <string>

# THEORY

# Control Structures

Control structures in C++ are used to control the flow of a program. They allow the program to make decisions, repeat tasks, or jump to different parts of the code based on certain conditions. The main types of control structures include conditional statements, loops, and jump statements.

# Functions

A function in C++ is a set of instructions that does one specific job. Instead of writing the same code again and again, you can write it once in a function and use it whenever you need. For example, if you want to add two numbers, you can make a function that adds them, and then just call that function whenever you need to add numbers. Functions can take input (called parameters) and can also give back a result (called return value).

# Standard Libraries

In C++, standard libraries are built-in collections of pre-written code that help you perform common tasks easily. These libraries include functions, classes, and objects that are ready to use for things like input/output, working with strings, files, and much more. For example, the <ioatream> library is used for input and output operations like cin>> and cout<<.