LAB # 5
Introduction To C++

Objective:

- To briefly introduce the C++ programming language.
- To introduce variables and named constants
- To introduce various data types.
- To introduce the assignment and cout statements
- To demonstrate the use of arithmetic operators

Theory:

The C++ Programming Language:

A C++ program as consisting of two general divisions: header and main. The **header**, or **global** section, gives preliminary instructions to the compiler. It consists of comments that describe the purpose of the program, as well as information on which library routines will be used by the program.

A main function indicates the start of the executable instructions. Every main must begin with a left brace { and end with a right brace }. The statements inside those braces will be explained as we progress through this lesson.

Memory:

A Memory storage is the collection of locations where instructions and data that are used by the program are temporarily stored.

Variables and Constants:

Components of memory in which data values stored can change during the execution of the program are called variables. Components of memory in which data values stored are initialized once and never changed during the execution of the program are called constants.

Identifiers in C++

Identifiers are used to name variables, constants and many other components of a program. They consist exclusively of letters, digits and the underscore _ char-acter. They cannot begin with a digit and cannot duplicate reserved words used in C++ such as ***int*** or ***if***.

Data Types:

Integer Data Type:

Integers are real numbers that do not contain any fractional component. C++ has three data types that are integers: **short, int** and **long.** The difference is strictly in the amount of

memory (bytes) they reserve: short reserving the least and long reserving the most. Larger integers may need the long data type.

Floating Point Data Type:

C++ uses both float and double to indicate floating point numbers, with double using more memory than float.

Character Data Type:

Character data includes the letters of the alphabet (upper and lower cases), the digits 0–9 and special characters such as ! ? . , *. All these symbols combined are called alphanumeric.

Boolean Data Type:

The Boolean data type allows only two values: true or false.

String Type:

It is a class for storing several characters in a memory location. We must "include" the string library (#include <string>) in the pro-gram header.

Assignment Operator:

The = symbol assigns the variable on its left the value on its right. For example, count = 8.

Arithmetic Operators:

Operation	C++ Symbol
addition	+
subtraction	-
multiplication	*
division	/
modulus	%

Lab Task:

Do task 5.1, 5.2, 5.3 and 5.4 given in file attached on LMS and attach your source code and output window with this file. And write your observation with lab task.

Post Lab:

Exercise 1: Fill in the indicated code, then compile and run the program. Continue to work on the program until you have no syntax, run-time, or logic errors.
The output should look similar to the following:
The preferred soda is Dr. Dolittle
The preferred snack is crackers
Out of 250 people 148 chose these items!
Each of these products were given a rating of A from our expert tasters
The other products were rated no higher than a B
Exercise 2: Is it possible to change the choice of FAVORITESODA by adding code within the main module of the program? Why or why not?
Exercise 3: Is it possible to change the choice of favoriteSnack by adding code within the program? Why or why not?

Code:

```
// This program demonstrates the use of characters and strings

// PLACE YOUR NAME HERE
#include <iostream>
#include <string>
using namespace std;
// Definition of constants
const string FAVORITESODA = "Dr. Dolittle"; // use double quotes for strings
const char BESTRATING = 'A'; // use single quotes for characters
int main()
{

char rating;                          // 2nd highest product rating
string favoriteSnack;                 // most preferred snack
int numberOfPeople;                   // the number of people in the
                                      survey
int topChoiceTotal;                   // the number of people who
                                      prefer the top choice

// Fill in the code to do the following:

// Assign the value of "crackers" to favoriteSnack

// Assign a grade of 'B' to rating

// Assign the number 250 to the numberOfPeople

// Assign the number 148 to the topChoiceTotal

// Fill in the blanks of the following:
cout << "The preferred soda is " << cout << "The preferred snack is " <<
cout << "Out of " << << " people "
<< << " chose these items!" << endl;
cout << "Each of these products    ;
were given a rating of " <<
cout << " from our expert tasters" << endl;
cout << "The other products were rated no higher than a " << rating
<< endl;
return 0;
}
```

Learning Outcomes:

Upon successful completion of the lab, students will be able to:

LO1: Have understanding of different data types.
LO2: Have understanding of arithmetic operators in C++
LO3: Write a program in C++