EXPERIMENT NO-1

Title: Write a program to implement function for person, student, and employee.

Objectives:

1. Write the basic structure of C++ program.
2. Apply cin and cout for I/O operation in C++
3. Write and call functions in C++.

Theory:

C++ program Structure:

In C++, a program is divided into the following three sections:

- Standard Libraries Section
- Main Function Section
- Function Body Section

```
#include <iostream>

using namespace std;
int main() {
cout << "Hello World!" << endl;
return 0;
}
```

Standard libraries section:

#include is a specific preprocessor command that effectively copies and pastes the entire text of the file, specified between the angle brackets, into the source code.

- The file **iostream**, which is a standard file that comes with the C++ compiler, is short for input-output streams. This command contains code for displaying and getting an input from the user. The header files in C++ do not contain .h extension. For example <string> in C++ and <string.h> from C are different.
- **Namespace** is a collection of names declared and is a prefix that is applied to all the names in a certain set. iostream file defines **std** namespace that contain names such as cin, cout and endl. Namespace helps to avoid the naming conflict is a big program.

main function section:

The starting point of all C++ programs is the main function. This function is called by the operating system when your program is executed by the computer. The opening curly bracket, { signifies the start of a block of code, and } signifies the end.

Compilation of CPP program on Linux Operating System:

In Linux, g++ compiler is available to compile the CPP programs.

For example:

g++ sample.cpp

after executing this command, the by default executable file created is a.out. different executable file can be created using following command.

g++ -o sample sample.cpp

The executable file created in above example can be executed using following commands

./a.out
Or
./sample

Input/Output in C++:

A program performs three basic operations: it gets data, it manipulates the data, and it outputs the results. In C++, I/O is a sequence of bytes, called a stream, from the source to the destination. The bytes are usually characters, unless the program requires other types of information, such as a graphic image or digital speech. Therefore, a stream is a sequence of characters from the source to the destination. There are two types of streams:
Input stream: A sequence of characters/bytes from an input device to the computer.
Output stream: A sequence of characters/bytes from the computer to an output device.

The standard input device is usually the keyboard, and the standard output device is usually the screen. To receive data from the keyboard and send output to the screen, every C++ program must use the header file **iostream**. This header file contains, among other things, the definitions of two data types, istream (input stream) and ostream (output stream). The header file also contains two variable declarations, one for **cin**, which stands for common input, and one for **cout** , which stands for common output.

The input data from the standard input device is read by using **cin** and the extraction operator >>. For example, if age is an integer variable, then

cin >> age;

reads an integer value from keyboard and stores in the variable age.

The data is sent to the output devices using cout and insertion operator <<. For example:

Cout << age;

Writes the value of the age variable to the output device.

Function:

- A function is a block of code that performs some operation.
- A function is described by a name that clearly describes it's use.
- A function can optionally define input parameters that enable callers to pass arguments into the function.
- A function can optionally return a value as output.
- Functions are useful for encapsulating common operations in a single reusable block.

A C++ function is used by taking following steps:

- Declaration of a function prototype.
- Definition of the function definition.
- Calling the function.

If a library function is used then the function is already defined in the header file and defined and compiled in the form of object files. A standard library header file to provide the prototype and included in the C++ source file. For example, the standard C library includes the **sin()** function to computer the sine of given angle in radians . The associated standard header file **cmath** contains the function prototype for **sin()** and several other maths related functions.

But for user defined functions, all three aspects—**defining, prototyping,** and **calling—**need to be handled by the programmer.

```
// calling.cpp -- defining, prototyping, and calling a function
#include <iostream>
using namespace std;

void simple(); // function prototype

int main()
{
    cout << "main() will call the simple() function:\n";
    simple(); // function call
    return 0;
}

// function definition
void simple()
{
    cout << "I'm but a simple function.\n";
}
```

Example: A function that takes an argument and returns the cube of the given number.

```
#include <iostream>
using namespace std;

void cheers(int); // prototype: no return value
double cube(double x); // prototype: returns a double

int main(void)
{
    cheers(5); // function call
    cout << "Give me a number: ";
    double side;
    cin >> side;
    double volume = cube(side); // function call
    cout << "A " << side <<"-foot cube has a volume of ";
    cout << volume << " cubic feet.\n";
    cheers(cube(2)); // prototype protection at work
    return 0;
}
void cheers(int n)        // definition of function cheers
{
    for (int i = 0; i < n; i++)
        cout << "Cheers! ";
    cout << endl;
}

double cube(double x)    // definition of function cube
{
    return x * x * x;
}
```

Procedure:

1. Declare the variables name, address, phone and birthdate for a person, class, prn, and avgmarks for students and empid, designation, and salary for employee.
2. Provide set and get method for each of the variable to store and retrieve value from it.
3. Call the functions and display the result.

Keywords:

istream, ostream, cin, cout, functions.