National University of computer and emerging sciences

Foundation for Advancement of Science and Technology

Programming Fundamentals

First C++ Code
and
How to Code in C++ - Introduction

Bilal Khalid Dar
bilal.khalid@nu.edu.pk

BS(SE) FALL-2025

First Code in C++

What is a Program Made of?

Three steps that a program typically performs

- Input: (gather input data)
  - from keyboard
  - from files on disk drives
- Processing
  - Process the input data
- Output
  - Display the results as output
  - Send it to the screen
  - Write to a file

Structure of a simple C++ program

```
// sample C++ program
//……..
#include <iostream>
using namespace std;
……..
int main()
{    ….
        cout<< "Hello, World!";
        return 0;
}
```

Comments

Pre-processor directives

Which namespace to use

Any global declarations

Beginning of function named main function

Start of the block main

Any local declarations

Statement

Send 0 to operating system

End of the block for main

Other functions

The #include directive & main function

- Pre-processor directive to insert the contents of another file into the program
  - #include lines ignored by compiler
  - NO semicolon at the end of #include line
- Every program has to have a main()
  - There can be only one main() as it defines the point from where a program starts executing
- The main() function returns control to the OS once it is finished executing a last statement in the code
- The return-type of main() is int in C++
- The program exits to the OS with a 0 if successful or non-zero (usually -1) if there is an error

Comments in the Code

- All programs are documented in order to allow other programmers to extend it.
- There are two types of comments:
  - Line Comment
- // A line comment should explain the logic of the current line in the program.

  - Block Comment
- /* This is a Block Comment.*/

The cout object

- Base C++ object, to send output to the screen
- Part of the iostream library which included in the first line of the program, otherwise there will be no interaction with the program
- The stream insertion operator << is used to send the output to the cout stream
- The escape sequence and endl

```
// sample C++ program
#include <iostream>
using namespace std;
Int main()
{
cout<< "Hello \n " << endl<< "World!";
return 0;
}
```

The \n is inside the quotes. (Also called 'escape sequence') it is not flushing the output buffer every time, it only flush it once at the end of the program.

endl causes a flushing of the output buffer every time.

Special Characters

Character	Name	Meaning
//	Double slash	Beginning of a comment
#	Pound sign	Beginning of pre-processor directives
< >	Open/close brackets	Enclose file name in #include
( )	Open/close braces	Used when naming a function
{ }	Open/close brace	Encloses a group of statements
“ ”	Open/close quotation marks	Encloses string of characters
;	Semicolon	end of a programming statement