Tishk International University
Faculty of Applied Science
Information Technology Department

Introduction to C++

Programming I

Lecture 2

Fall 2025

Course Code: IT117

Grade 1

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Outlines

- ✓ Introduction to C++
- ✓ Uses and Advantages of C++
- ✓ Basic Structure of a C++ Program
- ✓ Comments and Output (cout)
- ✓ New Lines and Special Characters

Learning Outcomes

- **At the end of today's session, you will be able to:**

  - ✓ Identify what C++ is and where it is used.
  - ✓ Explain the basic structure of a C++ program.
  - ✓ Apply cout, comments, and endl to display output.
  - ✓ Use special characters correctly in simple C++ programs.

What is C++?

- **C++** is a powerful general-purpose programming language. It can be used to develop operating systems, browsers, games, and so on.

Applications of C++

- **In what areas is C++ used?**
  - **Game development** (Unreal Engine, game engines)
  - **Operating systems** (Windows parts, macOS components)
  - **Embedded systems** (robots, devices, cars)
  - **Desktop software** (Adobe apps, browsers like Chrome parts)
  - **…**

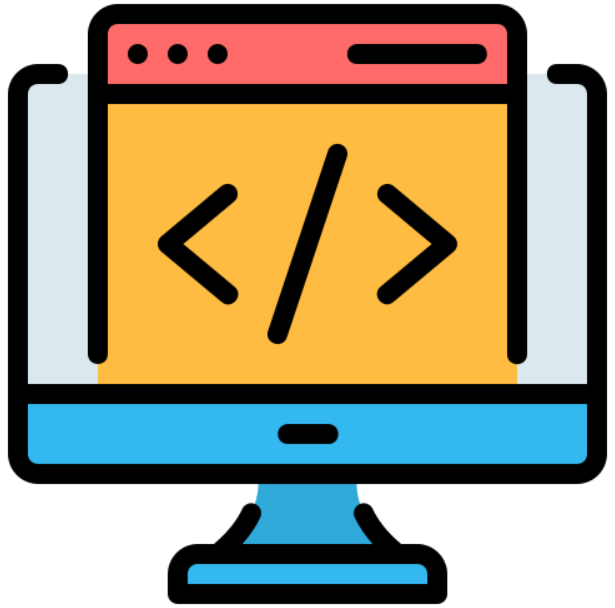
Who Developed C++?

- **C++** was developed by **Bjarne Stroustrup** in the early 1979s at Bell Laboratories.
- The first edition of his book “The C++ Programming Language” was released in 1985.
- **C++** is an extension of the **C** programming language with additional features, including classes, objects, and other features supporting object-oriented programming.

Advantages of Learning C++

- International standard.
- General purpose.
- Powerful yet efficient.
- Easy to move from C++ to other languages but often not in other direction.
- It is FAST.

Let’s Start To Learn C++!



Basic Structure of a C++ Program

```
#include<iostream>
using namespace std;
int main() {


    return 0;
}
```

We are putting our code here

Semicolon ;

Open Curly Brace {

Close Curly Brace }

Basic Structure of a C++ Program

```
#include<iostream>
```

- ✓ **iostream** is a library in C++ that provides input and output (I/O) functionalities

```
using namespace std;
```

- ✓ Use the standard C++ library names directly, so we don't have to write **std::** every time.

Basic Structure of a C++ Program

```
int main() {


    return 0;
}
```

`int main()` --> The starting point of the program.

`return 0;` --> Tells the computer that the program finished successfully.

The code inside **{ }** is what the program will do.

Comment

- **Comment** is a piece of text in your code that the compiler ignores.

➢ **Purpose**

✓ To explain what the code does.

✓ To make the code easier to read for humans.

Types of Comments

1. **Single-line comment**

   - Use // before the comment.

   Ex)
   ```
   // This is a single-line comment
   ```

2. **Multi-line comment**

   - Begins with /* and ends with */

   Ex)
   ```
   /* This is a
      multi-line comment */
   ```

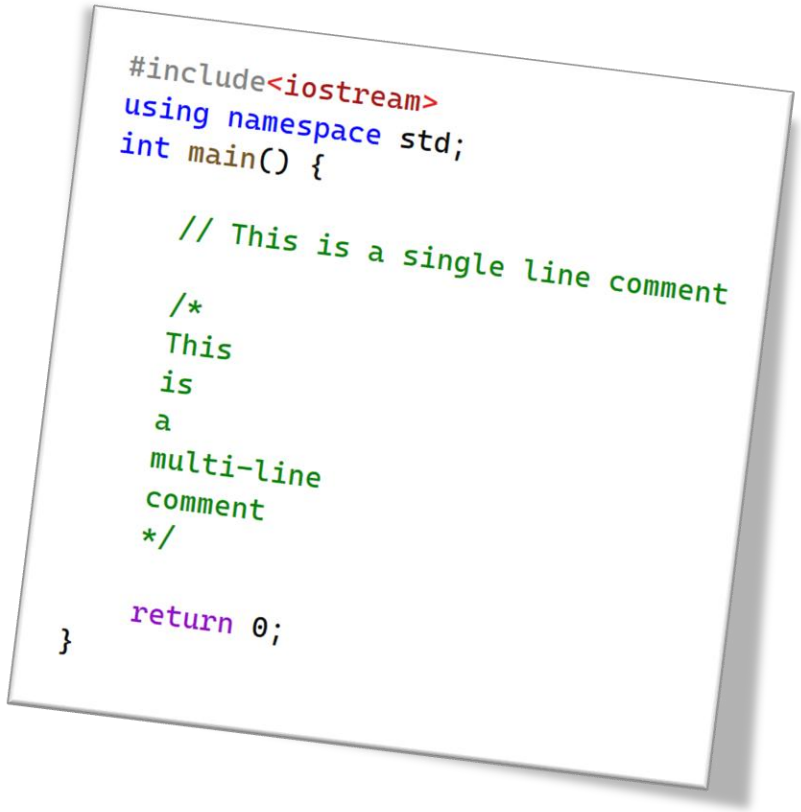
Types of Comments (Ex.)

Ex)

```
#include<iostream>
using namespace std;
int main() {

    // This is a single-line comment

    /* This is a
       multi-line comment */

    return 0;
}
```

Why Use Comments?

1. Comments help you to organize your thoughts.
2. Comments help you to remember what you did.
3. Comments help the other programmers to understand your program.



```
#include<iostream>
using namespace std;
int main() {

    // This is a single line comment

    /*
    This
    is
    a
    multi-line
    comment
    */

    return 0;
}
```

Printing Text in C++

- Printing text in C++ is done using the **cout** statement from the iostream library.
- **cout** stands for “character output”.

Basic Syntax → `cout << "Your text here";`

Text must be in double quotes.
<< is called the insertion operator.

Each cout statement must end with a semicolon (;) to indicate the end of the statement.

Printing Text in C++ (Ex.)

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

int main() {
    cout << "Hello, C++!";
    return 0;
}
```

Printing Text in C++ (Ex.)

```cpp
#include <iostream>
using namespace std;
int main()
{
    cout << "Programming is " << "great fun!";
    return 0;
}
```

Printing Text in C++ (Ex.)

```cpp
#include <iostream>
using namespace std;
int main()
{
    cout << "Programming is ";
    cout << "great fun!";
    return 0;
}
```

Printing Text in C++ (Ex.)

```cpp
#include <iostream>
using namespace std;
int main()
{
    cout << "Tishk International University ";
    cout << "Faculty of Applied Science ";
    cout << "Department of IT ";
    cout << "I like ";
    cout << "Programming";

    return 0;
}
```

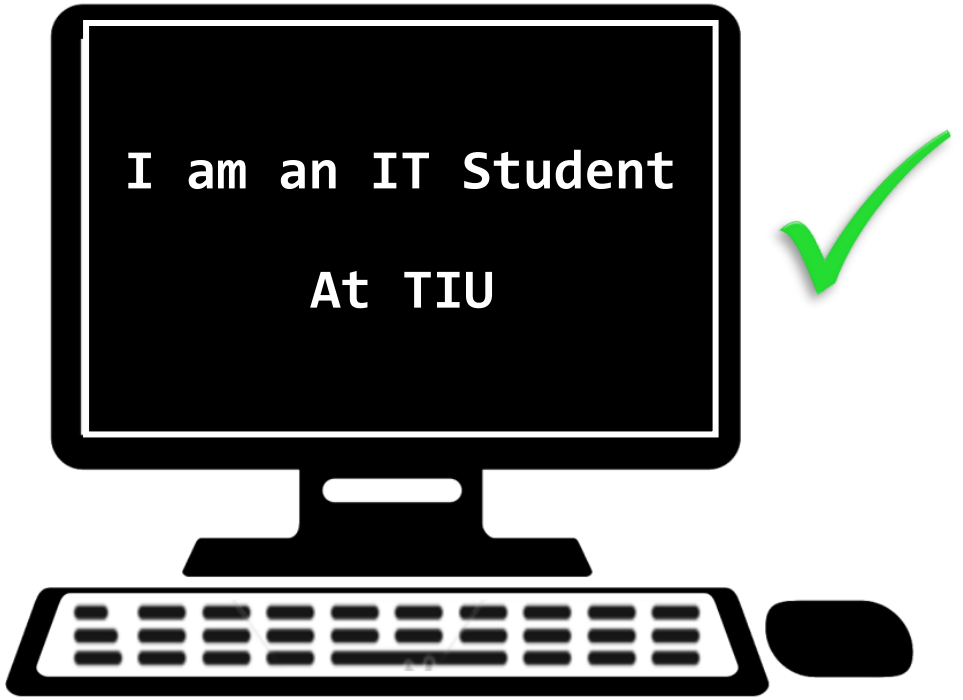
// Output

Tishk International University Faculty of Applied Science Department of IT I like Programming

Inserting New Line

- **endl** is used to insert a new line in the output.

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

int main() {
    cout << "I am an IT student" << endl;
    cout << "At TIU";
    return 0;
}
```



Special Characters

Character	Name	Description
`//`	Double slash	Marks the beginning of a comment.
`#`	Pound sign	Marks the beginning of a preprocessor directive.
`< >`	Opening and closing brackets	Encloses a filename when used with the `#include` directive.
`( )`	Opening and closing parentheses	Used in naming a function, as in `int main()`.
`{ }`	Opening and closing braces	Encloses a group of statements, such as the contents of a function.
`" "`	Opening and closing quotation marks	Encloses a string of characters, such as a message that is to be printed on the screen.
`;`	Semicolon	Marks the end of a complete programming statement.

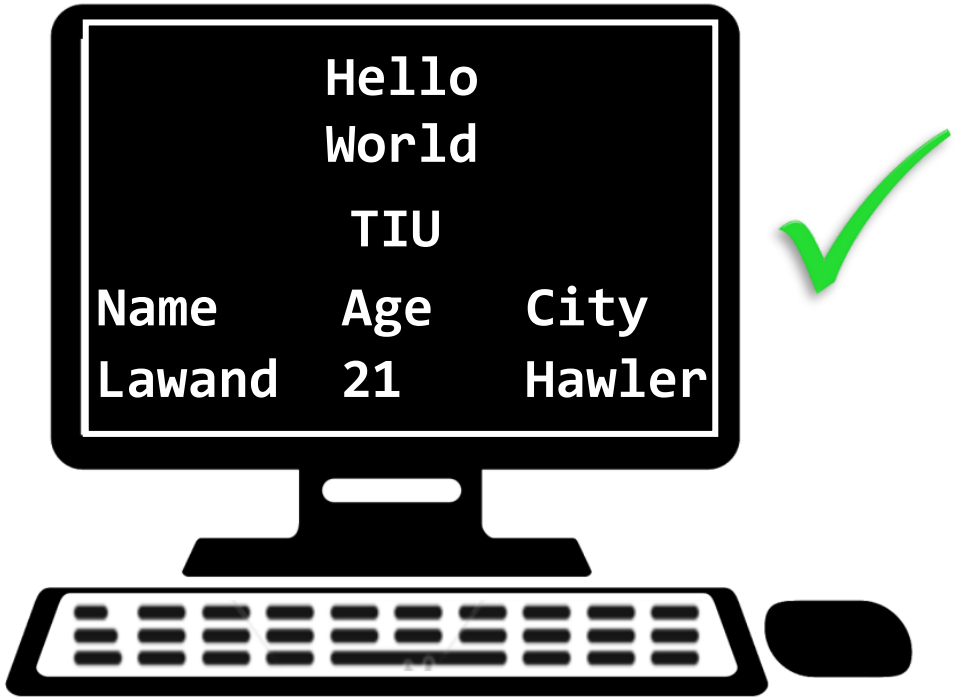
Special Characters

- Below are some characters in C++ that can be used with escape sequences (backslash \).

Control Characters	Punctuation Characters
\n = Newline	\" = Double quote
\b = Backspace	\\ = backslash
\t = Horizontal tab	

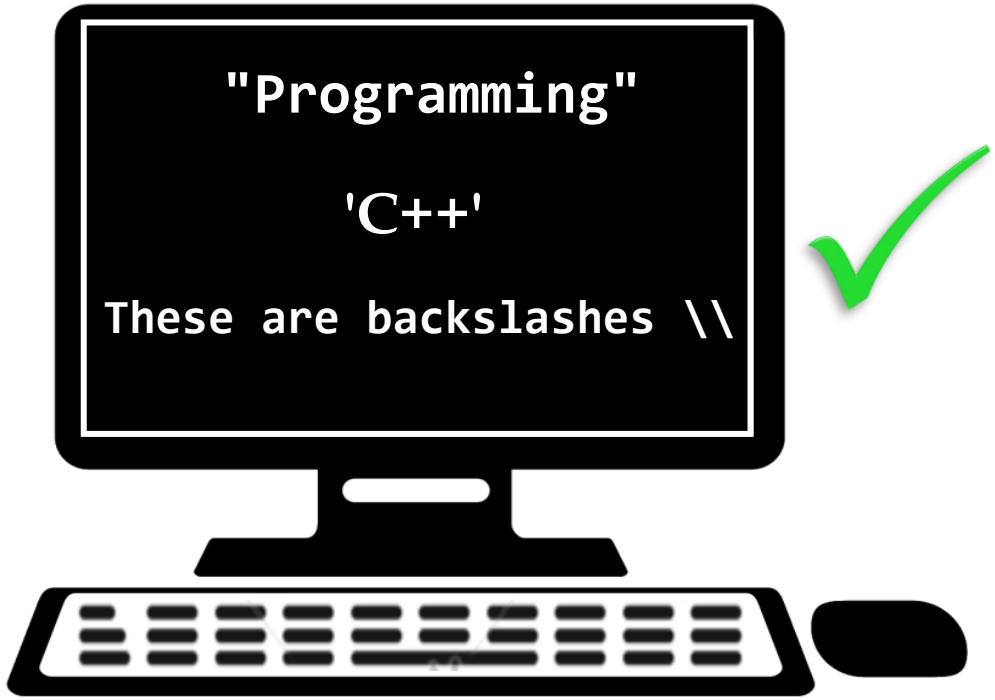
Special Characters (Ex.)

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

int main() {
    cout << "Hello\nWorld!" << endl;

    cout << "TIUS\b" << endl;

    cout << "Name\tAge\tCity\n";
    cout << "Lawand\t21\tHawler";

    return 0;
}
```



Special Characters (Ex.)

```cpp
#include <iostream>
using namespace std;
int main() {

    cout << "\"Programming\"" << endl;

    cout << "'C++'" << endl;

    cout << "These are backslashes \\\\";

    return 0;
}
```



Activities and Next Lecture's Topic

Activities

- Review this lecture note
- Practice

Next Lecture's Topic

- Variables

References

- LogicMojo. (2025). Top 100 C++ Interview Questions. https://logicmojo.com/cpp-interview-question
- Gaddis, T. (2014). Starting out with C++: Early objects (7th ed.). Pearson Education.

Thank You!