

Your First C++ Program

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1

Today

- In today's lecture we will
 - Write our first C++ program
 - Analyze the different components of C++ programs

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2

Problem

- Programs are written to solve problems
- Imagine that you have been asked to solve the following problem
 - Write a program that asks the user to enter their name and display a personalized welcome message.

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3

Your First C++ Program

```
1 //*****
2 // File name: hello.cpp
3 // Author: Bob Smith
4 // Date: 08/30/2006
5 // Purpose: This program displays a welcome message to
6 // the user
7 //*****
8 #include <stdafx.h>
9 #include <iostream>
10 #include <string>
11
12 using namespace std;
13
14 int main()
15 {
16     string name;
17
18     cout << "Type your name, then press enter" << endl;
19
20     cin >> name;
21
22     cout << "Hello " << name << "!" << endl;
23
24     return 0;
25 }
```

Program Output

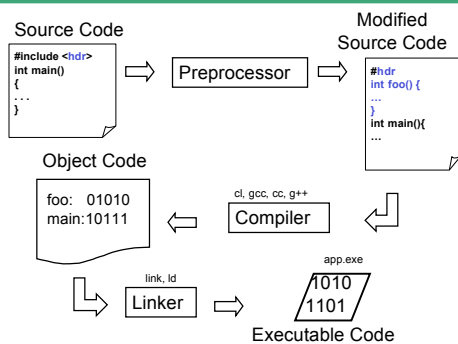
```
Type your name, then press enter
Shereen
Hello Shereen!
```

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4

Building an Application



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5

Language Elements

- Key Words
 - Have special meaning in C++
 - `using, namespace, int`
- Programmer-Defined Identifiers
 - Names made up by the programmer
 - `name`
- Operators
 - Perform operations
 - `*, =`
- Punctuation
 - Used to mark the beginning and end of the program

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6

Syntax

- Rules that must be followed when constructing a program
- Controls the use of key words, programmer-defined identifiers, operators, and punctuation

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Variables

- Names storage location in the computers memory
- Holds data
- The data can change

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8

Program Components

- The C++ program on the previous slide consists of the following elements:
 - Comments
 - Preprocessor directives
 - Standard namespace
 - `main` function
 - Declaration statements
 - Executable statements

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9

Comments

- Comments are
 - How you explain in English what the different parts of your program do
 - Ignored by the compiler
 - Very important
- The editor in Visual Studio will colour code your comments. They will be green

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10

Comments

- There are two ways to write comments
 - `// I am a comment`
 - Anything after `//` till the end of the line will be a comment
 - `/* I am another comment */`
 - You must start the comment with `/*` and end it with `*/` in this style of comment

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11

Preprocessor directives

- `#include <iostream>`
- `#` signifies preprocessor directive
- Processed before program translation
- `#include` tells the preprocessor to look for libraries
- `<>` signifies part of standard C++ libraries
- We'll see other examples of preprocessor directives later

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12

Preprocessor directives

- `iostream` is the input/output stream library
- It is needed to output data to the screen and read in data from the keyboard
- `#include` takes the contents of the library file and places them in the current program

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13

Namespace std

- `using namespace std;`
- Indicates that we will be using objects (`cout` & `cin`) that are named in a region called `std`
- The statement ends in a semicolon
- The statement appears in all our programs

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14

main Function

```
int main()
{
    // program statements
    return 0;
}
```

- Every program must have a main function
- It is where the start of your program execution begins
- `return 0;` ends the main function and indicates that the program terminated successfully
- Everything within the double braces `{}` should be indented

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15

Program Statements

- There are two types of statements that you can write inside the main (or any other) function
 - Declaration statements
 - Specify the data that is needed by the program
 - Executable statements
 - Perform operations
- All statements must end with a semicolon;

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16

Program Statements

- Declaration statements
 - No declaration statements in our program
- Executable statements

```
cout << "Type your name, then press enter" << endl;
cin >> name;
cout << "Hello " << name << "!" << endl;
```

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17

Program Skeleton

- All programs in C++ should have the following skeleton

```
/**
 * File name: filename.cpp
 * Author: Your Name
 * Date: 09/01/2004
 * Purpose: Description about what the program does
 */
#include <iostream>
using namespace std;
int main()
{
    // declaration statements
    // executable statements
    return 0;
}
```

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18

Summary

- Today we
 - Wrote our first C++ program
 - Introduced the basic components of a C++ program
- To see the program in action you should test it in Visual Studio 2005
- We covered p. 12 - 33 from your textbook