Your First C++ Program

September 2, 2009

Based on the C programming language

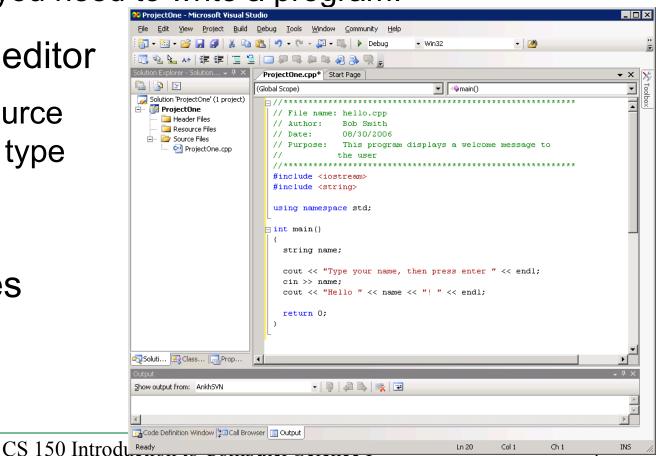
- One of today's most popular programming languages
 - used extensively in industry

- Language + Libraries
 - Libraries: bits of programs you can use

Visual Studio



- Microsoft Tools
 - Integrated Development Environment
 - all the tools you need to write a program!
- Source code editor
 - highlights source code as you type
- Debugger
- Extra Libraries



Problem

- Programs are written to solve problems
 - source code
 - process data

- 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

Your First C++ Program

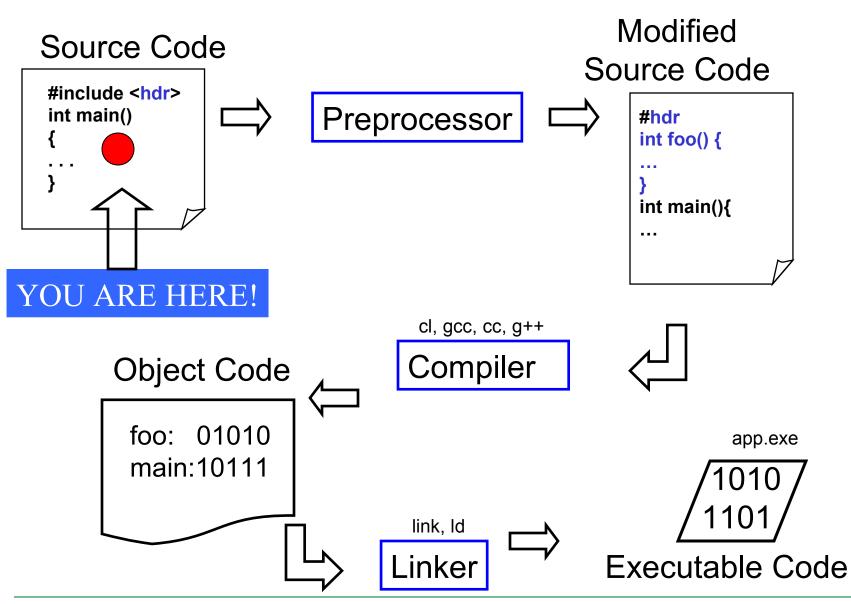
```
//**************
               // File name: hello.cpp
// Author: Bob Smith
// Date: 08/30/2009
// Purpose: This program displays a welcome message to
//
       the user
#include <iostream>
#include <string>
using namespace std;
int main()
 string name;
 cout << "Type your name, then press enter" << endl;
 cin >> name;
 cout << "Hello " << name << "!" << endl;</pre>
 return 0;
}
```

Program Output:

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

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Building an Application



CS 150 Introduction to Computer Science I

Language Elements

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

•;

Syntax (Grammar)

 Rules that must be followed when constructing a program

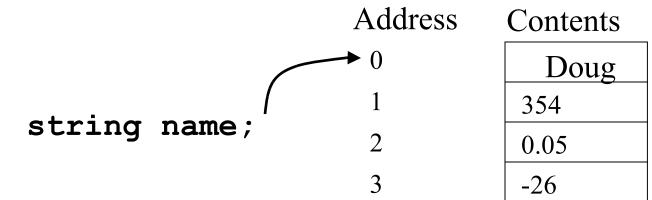
 Controls the use of key words, programmerdefined identifiers, operators, and punctuation

Variables

 Names storage location in the computers memory

Holds data

• The data can change



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

Comments

- Comments are
 - How you explain in English what the different parts of your program do
 - Ignored by the compiler
 - Very important for you and me

 The editor in Visual Studio will colour code your comments. They will be green

Comments

- There are two ways to write comments
 - $^{\circ}$ // I am a comment
 - Anything after // to the end of the line will be a comment
 - 0 /* I am another comment */
 - You must start the comment with /* and end it with
 * / in this style of comment

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

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

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

main Function

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

- 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
 - Style!

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;

Program Statements

- Declaration statements
 string name;
- Executable statements

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

cout << "Hello " << name << "!" << endl;</pre>

Program Skeleton

All programs in C++ should have the following skeleton

```
using namespace std;
int main()
{
    // declaration statements
    // executable statements
    return 0;
}
```

Do try this at home (or in the lab) !

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- Add New Item
 - C++ Source File

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Summary

- Today we
 - Wrote our first C++ program
 - Introduced the basic components of a C++ program
- We covered p. 12 33 from your textbook