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Computers & Programs

CS 124 – Intro to Software Development

Macbeth – Lesson 1.2

Agenda

- Opening Prayer
- Spiritual Thought
- Q&A
- John von Neumann
- First Look at Code
- Book Quiz
- Looking Ahead

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Spiritual Thought

"Somewhere in your quest for spiritual knowledge, there is that "leap of faith" as the philosophers call it. It is the moment when you have gone to the edge of the light and stepped into the darkness to discover that the way is lighted ahead for just a footstep or two. 'The spirit of man' … as the scripture says, indeed, 'is the candle of the Lord' (Prov 20:27)."

- Boyd K Packer

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John von Neumann

John von Neumann (1903-1957)

- Mathematics
- Computer Science
- Physics

One of the first proposals for a computer that could be programmed.

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Automatic Computing System

1.1 The considerations which follow deal with the structure of a *very high speed automatic digital computing system*, and in particular with its *logical control*. Before going into specific details, some general explanatory remarks regarding these concepts may be appropriate.

1.2 An *automatic computing system* is a (usually highly composite) device, which can carry out instructions to perform calculations of a considerable order of complexity—e.g. to solve a non-linear partial differential equation in 2 or 3 independent variables numerically.

The instructions which govern this operation must be given to the device in absolutely exhaustive detail. They include all numerical information which is required to solve the problem under consideration: Initial and boundary values of the dependent variables, values of fixed parameters (constants), tables of fixed functions which occur in the statement of the problem. These instructions must be given in some form which the device can sense: Punched into a system of punchcards or on teletype tape, magnetically impressed on steel tape or wire, photographically impressed on motion picture film, wired into one or more fixed or exchangeable plugboards—this list being by no means necessarily complete. All these procedures require the use of some code to express the logical and the algebraical definition of the problem under consideration, as well as the necessary numerical material (cf. above).

Once these instructions are given to the device, it must be able to carry them out completely and without any need for further intelligent human intervention. At the end of the required operations the device must record the results again in one of the forms referred to above. The results are numerical data; they are a specified part of the numerical material produced by the device in the process of carrying out the instructions referred to above.

Source: http://library.si.edu/digital-library/book/firstdraftofrepo00vonn
Source: http://www.wiley.com/legacy/wileychi/wang_archi/supp/appendix_a.pdf

Parts of C++ Program

Comments are added to document the Why and How. Only add comments to improve understanding. You will always have block comments at the top of the file and before each function. Two kinds of comment style in C++.

- Block: /* … */ (also called flowerboxes)
- Line: // …

Read as “pound include”. Identifies the libraries that we are using. “cout” and “cin” are part of the iostream library.

Allows us to write “cout” instead of “std::cout”. You will always use this in this course.

Every C++ program has a main function. This is where the software starts. Everything in the function is enclosed in curly braces { … }

Variables

Display to the screen

Read from the keyboard

Make decisions. Just like a function, the code in each case is enclosed in curly braces { … }

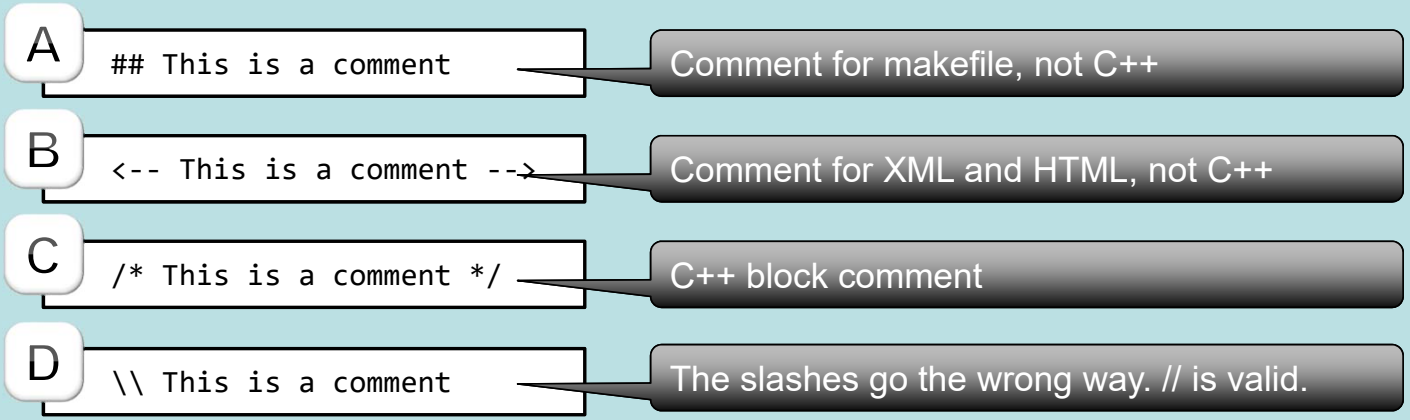
Exit the main function. 0 means no error. Other values mean error.

```
/*******************************************************************************
* Author:
*    Chad Macbeth
* Summary:
*    Answer to Everything Question Checker
*
*******************************************************************************/

#include <iostream>
using namespace std;

/*******************************************************************************
 * Ask the user for the answer to everything and check it.
 *******************************************************************************/
int main()
{
   int answer;

   cout << "What is the answer to everything? ";

   cin >> answer;

   // Check the answer provided by the user
   if (answer == 42)
   {
      cout << "You are correct!";
   }
   else
   {
      cout << "You are wrong!";
   }

   return 0;
}
```

Many code statements must end with a semicolon (;)

Book Quiz

Which of these is a valid C++ comment style:



Book Quiz

What is the purpose of comments in a program?

A. Comments make the program more understandable

B. Comments give instructions to the computer so it knows how to execute your program

C. Comments tell the compiler what libraries to include

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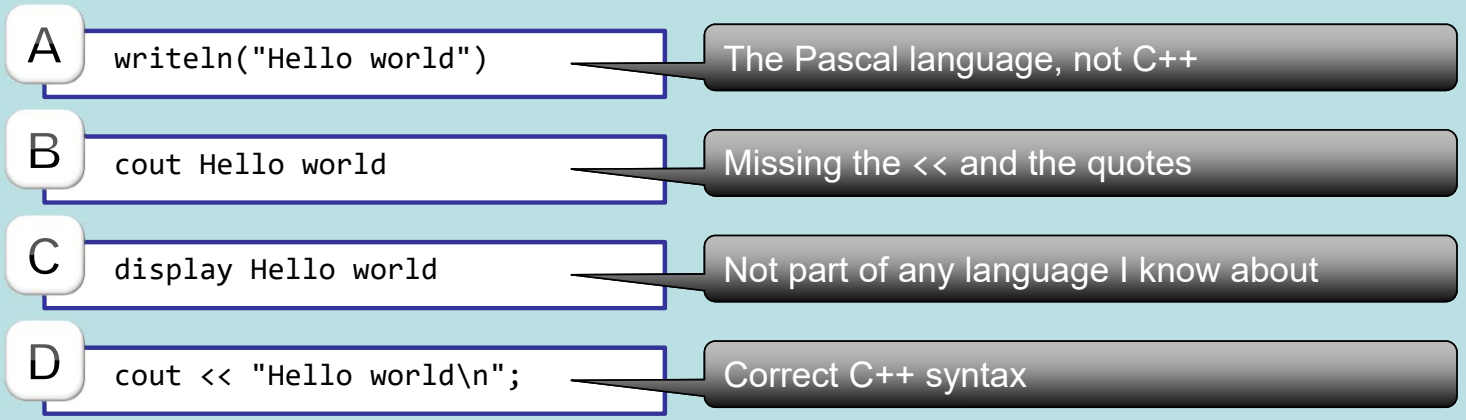
Book Quiz

Which of the following puts “Hello world” on the screen?



Book Quiz

What is missing from this program?

```
#include <iostream>

int main()
{
   cout << "Howdy\n";

   return 0;
}
```

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

int main()
{
   cout << "Howdy\n";

   return 0;
}
```

A Missing `namespace`

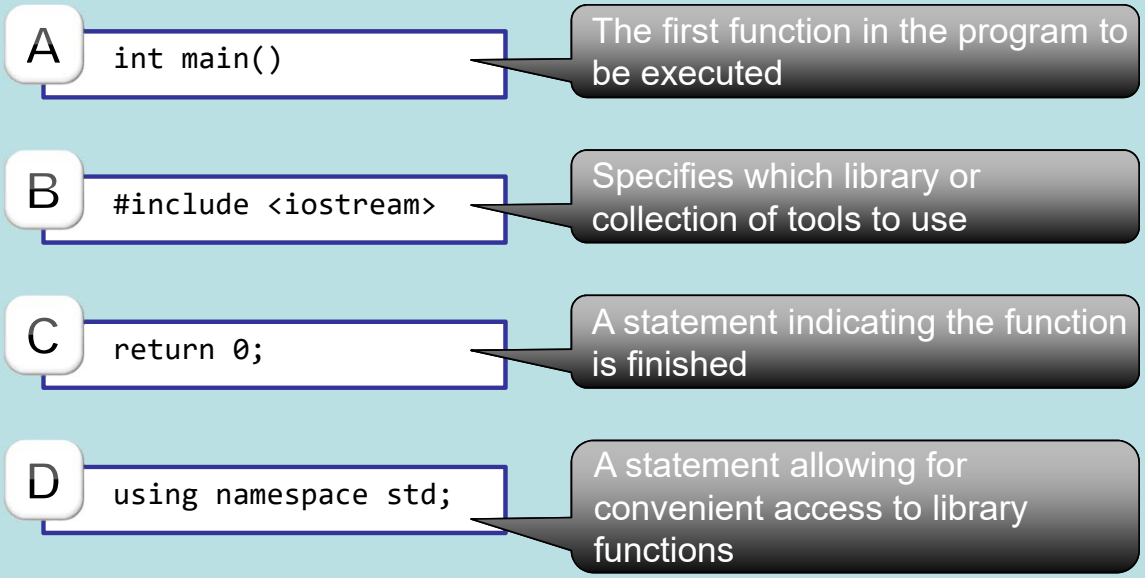
B Missing `;` after `<>`

C Missing "`end program`"

D Missing period after `}`

Book Quiz

Which of the following is a function?



Book Quiz

What is wrong with this program?

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

int main()
{
   cout << "Howdy\n";
}
```

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

int main()
{
   cout << "Howdy\n";

   return 0;
}
```

A. Wrong syntax for `namespace`

B. Missing `;` after `<iostream>`

C. Missing `return` before `}`

D. Missing colon after `()`

Looking Forward

- You must bring your laptop on Friday. We will be setting up your programming environment!!

- Before Class on Friday
  - 0.2 Prepare
    - Read http://computingcareers.acm.org – Top 10 Reasons to Major in Computing
    - Read “Getting Set Up in the Linux Lab” in I-Learn
    - The quiz should be taken after class.

- Before Class on Monday
  - 1.0 Prepare
    - Read Chapter 1.0 First Program
    - Submit assign10 (*)

(*) – For the first assignment this can be submitted by 11:59pm instead of before class