

CSCI 1370

JANUARY 23, 2016

THE PROGRAMMING ENVIRONMENT

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run ▶



Due: Jan 26, 2017 09:59 pm

submit

```
1 #include <iostream>
2 using namespace std;
3
4 int main()
5 {
6     cout << "Hello world!";
7 }
```

REPL.IT

gcc version 4.6.3

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Carefully step through the tasks listed below to familiarize yourselves with the programming environment.

As you are going through the tasks, take a minute to discuss what happens and why (see NOTES).

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INTRODUCTION TO C++

C++ is an *artificial* language.

(For comparison, English, Spanish, French, etc. – are referred to as *natural* languages.)

A **statement** in C++ is like a sentence in natural language.

(Except C++ statements are terminated by **semicolons**.)

C++ OPERATORS

To tell the computer to do something, we can use something called an **operator**.

There are a number of operators, with each specifying a particular operation...

Addition operator (+): *add two things.*

Subtraction operator (-): *subtract one thing from another.*

Multiplication operator (*): *multiply two things.*

Etc.

THE PRINT STATEMENT

A handy operator to know: <<

This is the **insertion operator**. This instructs the computer to print something, somewhere. For example:

```
cout << "Hello!";
```

THE PRINT STATEMENT (CONT.)

We can print more than just **string literals**. For example:

```
cout << 5;
```


THE PRINT STATEMENT (CONT.)

Alternatively, instead of `cout << 5;`, we could write:

```
cout << 2 + 3;
```

COMBINING OPERATIONS

Given the following statement, what will the computer do?

```
cout << 1 + 2 + 3 - 4;
```

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COMBINING OPERATIONS

Given the following statement, what will the computer do?

```
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```

COMBINING OPERATIONS

Given the following statement, what will the computer do?

```
cout << 3 + 3 - 4;
```

COMBINING OPERATIONS

Given the following statement, what will the computer do?

```
cout << 6 - 4;
```


COMBINING OPERATIONS

Given the following statement, what will the computer do?

```
cout << 2 ;
```

COMBINING OPERATIONS (CONT.)

Given the following statement, what will the computer do?

```
cout << 110 - 10 << 0;
```

COMBINING OPERATIONS

Given the following statement, what will the computer do?

```
cout << 110 - 10 << 0;
```

COMBINING OPERATIONS

Given the following statement, what will the computer do?

```
cout << 100 << 0;
```

COMBINING OPERATIONS

Given the following statement, what will the computer do?

```
cout << 100 << 0;
```

COMBINING OPERATIONS

Given the following statement, what will the computer do?

```
cout << 100 << 0;
```


VARIABLES

ADDRESSING

Addressing refers to the storage and retrieval of data via a numeric *address*.

A computer with 1GB of RAM has ~one billion locations to store data. Since locations where data can be stored are *sequential*, the first location starts at address 0. The last location is around address 999,999,999.

ADDRESSING (CONT.)

What if you owned a storage facility with one billion lockers? Imagine trying to keep track of what went where, with just your memory...

ADDRESSING (CONT.)

We're in a similar situation...When we program computers, we have to keep track of the data that we have/want to retrieve.

This becomes easier if we *name* locations. For example, instead of ~"*store this data at location 986,247,124*", we can tell the computer to "*store this data at location x*".

VARIABLES

Before a program stores a piece of data, it must allocate space in memory. This involves reserving space at some location in memory and giving that location a *name*.

A **variable** is just that – a named, reserved address in memory.

VARIABLE DECLARATION

To reserve space in memory for a piece of data, we make a **variable declaration** statement.

Variable declarations are comprised of a **type** and a name (**identifier**).

For example:

```
int x
```


DATA TYPES

In C++, every variable must have a type (it tells the computer how much space to reserve and how to process the data).

Some C++ data types:

`int`: integer (e.g., 1)

`float`: real number (e.g., 1.0)

`char`: character (e.g., `h`)

`string`: string of characters (e.g., "hello")

IDENTIFIERS

There are some rules about naming our variables...Identifiers can consist of letters, digits, and the underscore character (_). However, they **must begin with a letter or underscore.**

For example:

`first`, `First`, `_1st`, and `f_1_r_s_t` are all valid identifiers

THE READ STATEMENT

Another handy operator to know: >>

This is the **extraction operator**. This instructs the computer to extract some data from somewhere and to save it in memory. For example:

```
string s;  
cin >> s;
```

A SIMPLE PROGRAM

```
string s;
```

```
cout << "Hello! What is your name?";
```

```
cin >> s;
```

```
cout << "Nice to meet you, " << s;
```

PARTICIPATION ACTIVITIES

GROUP COLLABORATION

Must fill out pre-questionnaire to receive group assignment.

Purpose is to learn-by-teaching (1370) and provide peer resources (1380).

First group meeting due by this Thursday (Jan. 26) 8pm.

ASSIGNMENTS

This week's exercises (due by this Friday, 10pm) posted to repl.it
(main classroom).