

CS 142 C++ Basics



Announcements

- Program 4 due Tuesday, 3/17th by 11:55pm

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A bit of history

- Transitioning to C++ programming language
- C++ history
 - Offshoot of the language C (1969-73)
 - Developed by Bjarne Stroustrup starting in 1979.

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Python vs. C++

Python	C++
- Interpreted	- Compiled
- Dynamically typed	- Statically typed
<ul style="list-style-type: none"> • <code>def square(x)</code> <code>return x * x</code> • You can call <code>square("two")</code> 	<ul style="list-style-type: none"> - Program won't even run if you tried the square example – C++ compiler will flag it as an error

Different syntax; same control structures.
Differences are cosmetic.

Both are object-oriented languages.

C++ is similar to Python in that you can do non-object oriented stuff as well.

Going to introduce C++ for a few weeks without any OO, then put in the OO later.

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Writing your first C++ program

- Use handout

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Parts of the code

```
#include <iostream>
```

```
using namespace std;
```

```
int main()
{
    cout << "Hello World\n";

    return 0;
}
```

Like an import statement
Unlike Python, you don't get
print and input and all for free
Must have this line in every
program.

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Parts of the code

```
#include <iostream>
```

```
using namespace std;
```

```
int main()
{
    cout << "Hello World\n";

    return 0;
}
```

Kind of like
from X import * in Python
Also needs to be in all your
programs.

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Parts of the code

```
#include <iostream>
```

```
using namespace std;
```

```
int main()
```

```
{
    cout << "Hello World\n";
```

```
    return 0;
```

```
}
```

Instead of def main():

Instead of
print("Hello World")

Technically, in C++ the main function has
to return a value because it is declared as
"int main" which means "main function
should return integer data type"
0 tells the operating system that the
program ran successfully.

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Parts of the code

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

C++ uses semicolons at the end of each statement.

```
int main()
{
    cout << "Hello World\n";
    return 0;
}
```

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Parts of the code

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

Cout does not put a newline at the end. Use `\n` or `endl`.

```
int main()
{
    cout << "Hello World\n";
    return 0;
}
```

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Parts of the code

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

Indentation (technically) does not matter. Instead, what matters is the curly braces. You should still indent with curly braces because it makes your program easier to read!

```
int main()
{
    cout << "Hello World\n";
    return 0;
}
```

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Data Types

- You must declare your variables before you use them!!!
 - int
 - float
 - string [to use strings `#include<string>`]
 - We'll talk about other types later.
 - All variables are local, like Python.
- Can declare them ANYTIME before using them, but when in doubt, declare them at the top of the function.

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Variables

- Declaring variables

```
int x, y; //declares 2 integer types with names x and y
```
- Assigning values to variables

```
x = 5;  
y = 7;
```
- Combining into single statement

```
int x = 5;  
int y = 7;
```

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Getting Input

- Use cin keyword

```
cin >> x >> y;
```
- You need to write your own prompt with cout.
- Cin can input multiple things at the same time.
- With strings, only reads one word at a time, not a whole line.
- Like Python, your program MIGHT crash/MIGHT keep running with bad data if you try to cin an int, but type a float.

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C++ Demo Program

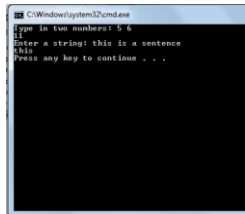
```
#include <iostream>
#include <string>

using namespace std;

int main()
{
    int x, y;
    string s;
    cout << "Type in two numbers: ";
    cin >> x >> y;
    cout << x + y << endl;

    cout << "Enter a string: ";
    cin >> s;
    cout << s << endl;

    return 0;
}
```



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