

# CS 180: Intro to C++

Note Title

8/29/2011

## Announcements

- New Turing/lab passwords will be emailed to you later today
- Wed at 4pm there is an intro to lab overview.

## Resources for this class

- Text book

- Transition guide (look for pdf on  
webpage)

- cplusplus.com

- Tutoring & office hours

This course: data structures in C++

First, C++. (More on that next.)

But — what is a data structure?

a container for data

— each has different functionality

- speed
- versatility
- type of data
- space

# C++ versus Python

High level versus low level.

Python

C++

Interpreter versus compiler.

runs "on the fly"

2 steps: compile then run

Dynamic versus static typing

```
x = 5  
x = 'hello'
```

```
float x;  
x = 5;  
x = 'h'; ← error
```

## Why learn C++?

- faster

~~\*~~ - ubiquitous

- understand low level details

- control

# Comparison

## Python

```
1 def gcd(u, v):
2     # we will use Euclid's algorithm
3     # for computing the GCD
4     while v != 0:
5         r = u % v    # compute remainder
6         u = v
7         v = r
8     return u
9
10 if __name__ == '__main__':
11     a = int(raw_input('First value: '))
12     b = int(raw_input('Second value: '))
13     print 'gcd: ', gcd(a,b)
```

## C++

```
1 #include <iostream>
2 using namespace std;
3
4 int gcd(int u, int v) {
5     /* We will use Euclid's algorithm
6     for computing the GCD */
7     int r;
8     while (v != 0) {
9         r = u % v;    // compute remainder
10        u = v;
11        v = r;
12    }
13    return u;
14 }
15
16 int main() {
17     int a, b;
18     cout << "First value: ";
19     cin >> a;
20     cout << "Second value: ";
21     cin >> b;
22     cout << "gcd: " << gcd(a,b) << endl;
23     return 0;
24 }
```

## White space

- returns, tabs, etc. are ignored in C++

```
int gcd(int u, int v) { int r; while (v != 0) { r = u % v; u = v; v = r; } return u; }
```

↑ not acceptable for HW

(Recall that these were very important in python)

Here, we use `()` and `{}` to mark loops, booleans, etc.

## Compiling

- In Python, you save code as gcd.py  
& then type "python gcd.py" to run it.

- In C++:

- Save as gcd.cpp

- type "g++ -o gcd gcd.cpp"

- type "./gcd"