Python
May 2, Ch 404
HIDE AND SEEK CHAMPION
; SINCE 1958
Announcement

Lab this week: optional... you will take last year's final exam then go over solutions (bring your own paper!)

Homework: start early... might need to remote connect

More study: see flyer on next slide/webpage
Are you in CSCI 1001, CSCI 1113, CSCI 1133? Studying for finals?

Social Coding is hosting a study session this Friday, May 6th from 5pm to 7pm in the Keller Atrium (1-175) at table 2.

Questions? Feel free to email us at coding@umn.edu
Similarities

Python and C++ are both object oriented languages, with all the standard stuff:

- Functions
- Arrays
- Classes (with inheritance)

However, beyond this very fundamental level, they start to differ very quickly
Similarities

This might be similar to an electric car vs. a gas powered car...

They both drive you places, but work in completely different ways
Differences

Python does not have:
Strict types
Pointers
Dynamic memory (new/delete)

... and completely different syntax:
No semi-colons
No braces
White space matters
No main()...
Differences

Python also can skip the “compile” step, so in some sense there is no difference between a syntax and runtime error.

All these simplifications come at a cost: speed (not normally 100x slower).
Hello world!

Let's start with the basics, printing to terminal

In C++ we use:

```cpp
int main()
{
    cout << "Hello world!" << endl;
}
```

In python, we use a print function with the input of what we want displayed

`print("Hello world!")`

(see: helloWorld.cpp)
While there are types in python, you do not need to declare a variable with a type upfront instead, you can directly store a variable with whatever value you want it to hold.

You can put in values of different types, and the variable will change accordingly.(see: looseTypes.cpp)
One of the few things python more strict about than C++ is whitespace

This is because there are no semi-colons or braces to indicate where lines or blocks stop

You **must** indent whenever you would use a block (i.e. `{ and }`) in C++

(see: functionsAndIf.cpp)
Classes & inheritance

Classes and inheritance work pretty much the same way as C++ (except everything is virtual and there are no pointers)

You still have “constructor”, though you write them slightly differently

You also have to denote variables in the class with “self.”, which is similar to “this” in C++ (see: classesAndInheritance.cpp)
Despite their differences, most of the fundamentals are the same:

You need to frame the problem and decide what you need to store to solve it.

After this point, you have the same tools (if/else, loops, functions, arrays, classes) just a different notation.
Mini-problem

For the rest of the time, I will solve this midterm 2 problem in python:

Problem (5) [15 points] Write a C++ code segment that reads a sentence from the keyboard. You then need to write a modification of this sentence into a file called ”garble.txt”. The modified sentence you write to the file should do two things: (1) change any lower case ”e” to two upper case ones and (2) add ”z” to the end of every word (i.e. before a space). An example sentence and what should be written to the file is provided below.

<table>
<thead>
<tr>
<th>Sentence</th>
<th>File result</th>
</tr>
</thead>
<tbody>
<tr>
<td>hello thEre, human</td>
<td>hEEllloz thErEE,z humanz</td>
</tr>
</tbody>
</table>

(see: stringMash.py)