

CIS 122

Intro to Programming and
Algorithms

Welcome to CIS 122!

- Intro to Programming and Algorithms
- Class Times
 - Weekdays
 - 1:00 - 1:50
 - Klamath Lab B26

Who am I?

- Greg Bickerman
 - Deschutes 241
 - gbick@cs.uoregon.edu
- Office Hours
 - Daily
 - 2:00 - 2:50
 - The other Klamath Lab

What is this class all about?

- Learn how to program
 - (in Python)
- Learn to think computationally
 - Solving problems programmatically
- Learn about computer science
 - Maybe you'll take more CS classes
- Have fun!

Logistics

- Grade Breakdown
 - 60% Homework
 - 15% Midterm Exam
 - 25% Final Exam
- Homework
 - Weekly
 - Due Sunday night 11:59
 - Blackboard Submission

Logistics

- Course Website

- www.cs.uoregon.edu/classes/12U/cis122
- Homework
- Announcements
- Useful information

- Blackboard

- Homework submission
- That's it

Logistics - Homework

- Multi-part assignments
 - Builds on concepts from class
 - Won't be able to do it all at once
 - But don't wait until the last minute
- Late policy
 - Assignments due Sunday night 11:59
 - -10% per day late
 - Tell me about extenuating circumstances *beforehand*
- Pair Programming
 - Work together!

Pair Programming

- You are encouraged (but not required) to work in pairs
 - Easier Work!
 - Finish Faster!
 - Learn More!
- Pair Programming is NOT
 - An excuse for someone to do your work for you
 - Splitting up the assignment
- So, what is pair programming?
 - Both members present while coding
 - Both members should be contributing
 - Equal time at the keyboard

Academic Honesty

- Plagiarism is a fine line
- Brainstorming together is good
 - But don't copy other people's work
- As a rule, you should be writing your own code
 - Possibly while pair programming
- Credit the people and sources that help you
 - Especially while pair programming

Lab Space

- This class is held in a computer lab
- That can be a good thing!
 - Hands on experience
 - Don't just watch...
 - Experiment and explore
- It can also be a bad thing...
 - Distractions
 - Facebook
 - Email

What is Computer Science?

What is Computer Science?

- Hardware vs Software
- Hardware
 - The physical computer
 - Wires, keyboard, mouse, monitor...
 - If you can smash it, it's hardware
- Software
 - Hardware is dumb
 - Software tells the hardware what to do
 - Sets of instructions

What is Computer Science?

- Software Engineering
- Computer Architecture
- Complexity
- Computability
- Artificial Intelligence
- Graphics
- ...

What is Computer Science?

- Computer science is the art of problem solving
- I want to accomplish some task
 - Convert centimeters to inches
 - Sort a deck of cards
 - Play a game of tic-tac-toe
- Where do I start?
 - These problems are complicated (relatively speaking)
 - Break down your problem into basic steps

How do you sort a deck of cards?

What is Computer Science?

- **Algorithm**

- a step-by-step procedure for solving a problem or accomplishing some end, especially by a computer

"algorithm." *Merriam-Webster.com*. 2011. <http://www.merriam-webster.com> (24 June 2012).

What is Computer Science?

"Computer Science may be more than programming, but it is not less than programming"

~Kurt Guntheroth

What is Programming?

What is Programming?

- Communicating with a computer
 - Not just any type of communication
 - Using Facebook is not programming
- Set of instructions
 - Specific
 - Precise
- General purpose
 - You can code whatever you want

How do we Communicate?

- We communicate with each other using **Natural Languages**
 - English
 - Spanish
 - Japanese
- We communicate with computers using **Programming Languages**
 - C++
 - Java
 - Python

Why use Python?

- Why can't we just talk directly to the computer

Why use Python?

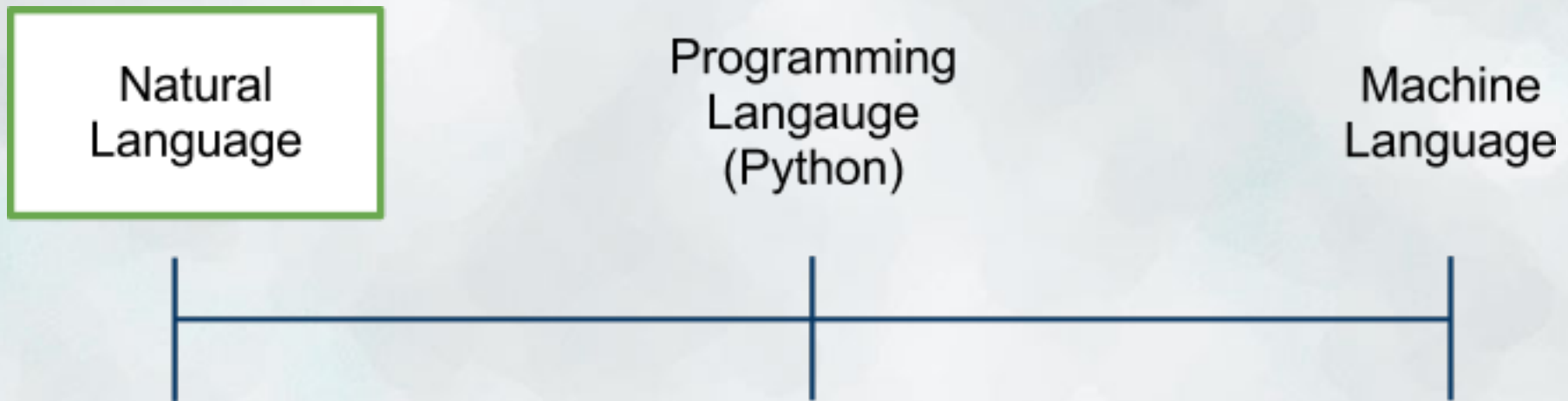
Natural
Language

Programming
Language
(Python)

Machine
Language



Why use Python?



How many inches are in 7 centimeters?

Why use Python?

Natural
Language

Programming
Language
(Python)

Machine
Language

```
10110101010101110101000110101  
00101101010101010101010100100  
10100010100010101111010100101  
11010101010100111110001010111
```

Why use Python?

Natural
Language

Programming
Language
(Python)

Machine
Language



```
centimeters = 7
ratio = 0.4
inches = centimeters * ratio

print inches
```

Why use Python?

- There are lots of programming languages
- Many in common use
 - C++
 - Java
 - Python
- Why use Python specifically?

Hello World in Java

```
class Hello {  
    public static void main(String[] args) {  
        System.out.println("Hello World");  
    }  
}
```

Hello World in Python

```
print "Hello World"
```

So how do we talk to Python?

- We write code using an editor
- Python reads code using an interpreter
- IDLE
 - Editor and Interpreter in one!
- Let's get started