Programming Abstractions in C++

CS106X

Cynthia Lee

Today's Topics

1. Introductions
2. Course structure and procedures
3. What is this class? What do we mean by "abstractions"?
4. Introduce the C++ language from the Java programmer's perspective (but it's ok if you're not a Java programmer!)
   - Functions
   - Strings
   - Streams

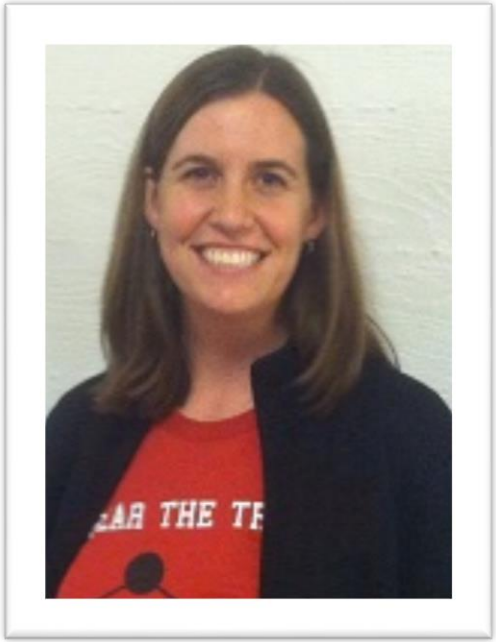
Next lecture:

- Strings and streams, continued
- Data structures: Grid

Introductions

WELCOME TO CS106X!

Cynthia Lee



cbl@cs.stanford.edu

Who Am I? Cynthia Lee

Research:

- PhD @ UCSD: market-based resource allocation in large-scale systems
- Recently: computer science education

Teaching:

- 2 years at Stanford, 3 years at UCSD
- Courses: CS2 C++, CS1 Java, CS1 Matlab, CS2 Java, theory of computation, discrete mathematics, data structures, probability and statistics for CS, computer organization and systems with IA32, computer architecture, technical interviews prep

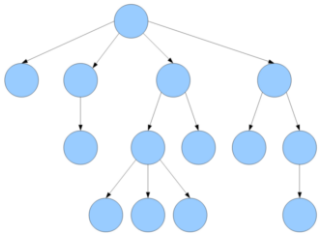
Software engineer:

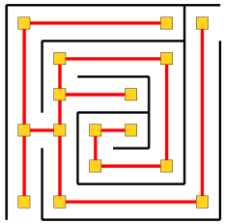
- iPhone educational games
- Document clustering and classification

When I'm not working:

- Biking, climbing, hiking

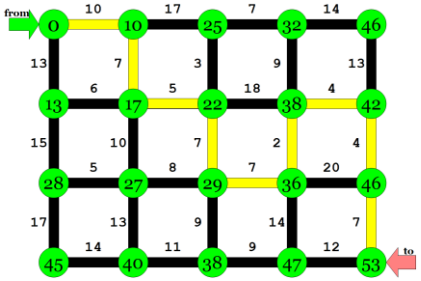
What is CS 106X?



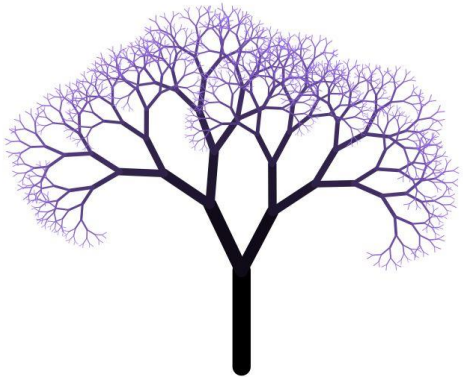


CS 106X: PROGRAMMING ABSTRACTIONS

- solving big problems and processing big data
- learning to manage complex data structures
- algorithmic analysis and algorithmic techniques such as recursion
- programming style and software development practices
- familiarity with the C++ programming language



PREREQUISITE: CS 106A OR EQUIVALENT



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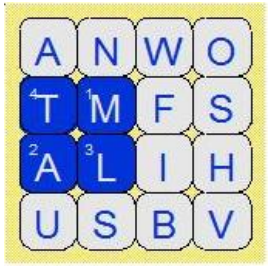
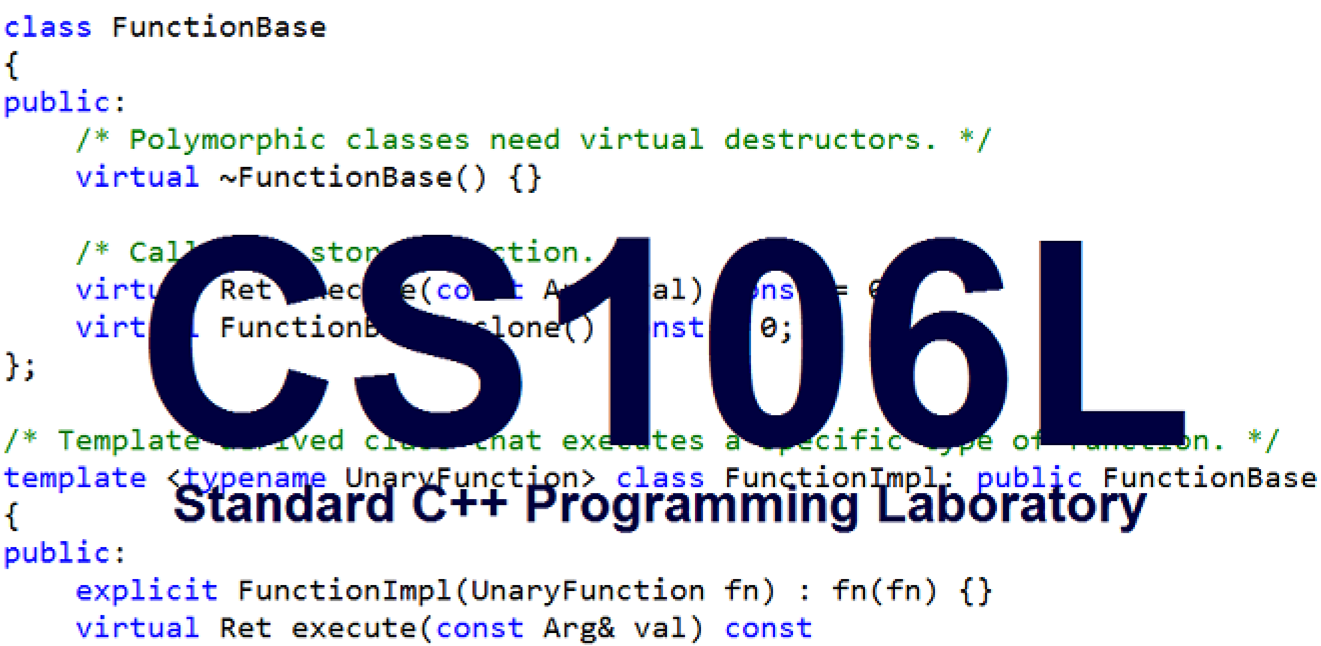


Possible addition to your repertoire: CS 106L

A ONE-UNIT COURSE TO LEARN AND PRACTICE C++ PROGRAMMING IN DEPTH

- Instructor: Cristian Cibils Bernardes
- Tu/Th 1:30-2:20, Lathrop Library (there is no enrollment cap)
- Take it this quarter if it fits, or it will be offered again in Spring



Discussion Section, SLs

SECTION LEADERS: HELPFUL UNDERGRADUATE ASSISTANTS WHO WILL:

- run your discussion section each week
- grade your homework assignments and exams
- help you when you have questions
- ... and much more

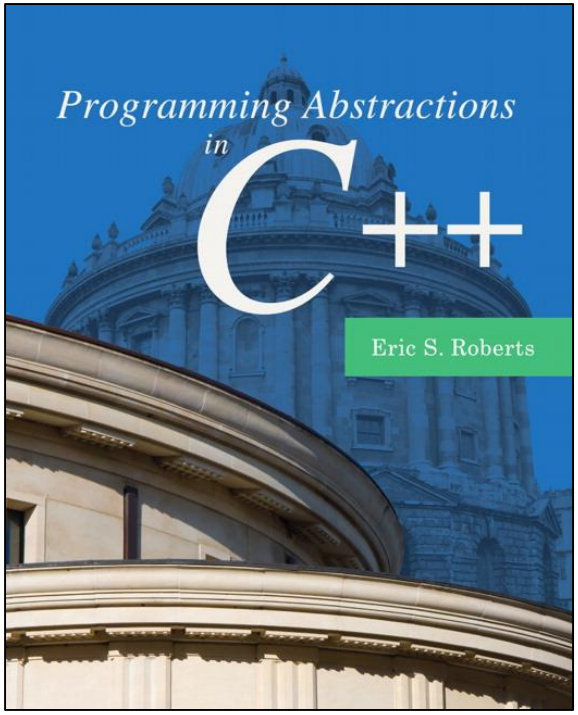
Textbook

Programming Abstractions in C++, by Eric Roberts

- Written here at Stanford
- Tailored to this course
- A valuable reference
- Usable on open-book exams

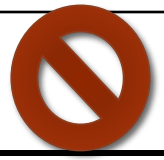
- Available on reserve at library
- Either buy a copy,
  or have access to one when you need it

- A PDF of it exists on the class web site, though note that PDF is not usable on exams



Late Days

LATE DAY: ALLOWS YOU TO SUBMIT A HOMEWORK **1 LECTURE DAY** LATE

Week	Sun	Mon	Tue	Wed	Thu	Fri	Sat
1							
2				due	1 day late	1 day late	2 days late
3	2 days late	2 days late	3 days late	3 days late			

What is this class about?

WHAT DO WE MEAN BY "ABSTRACTIONS"?

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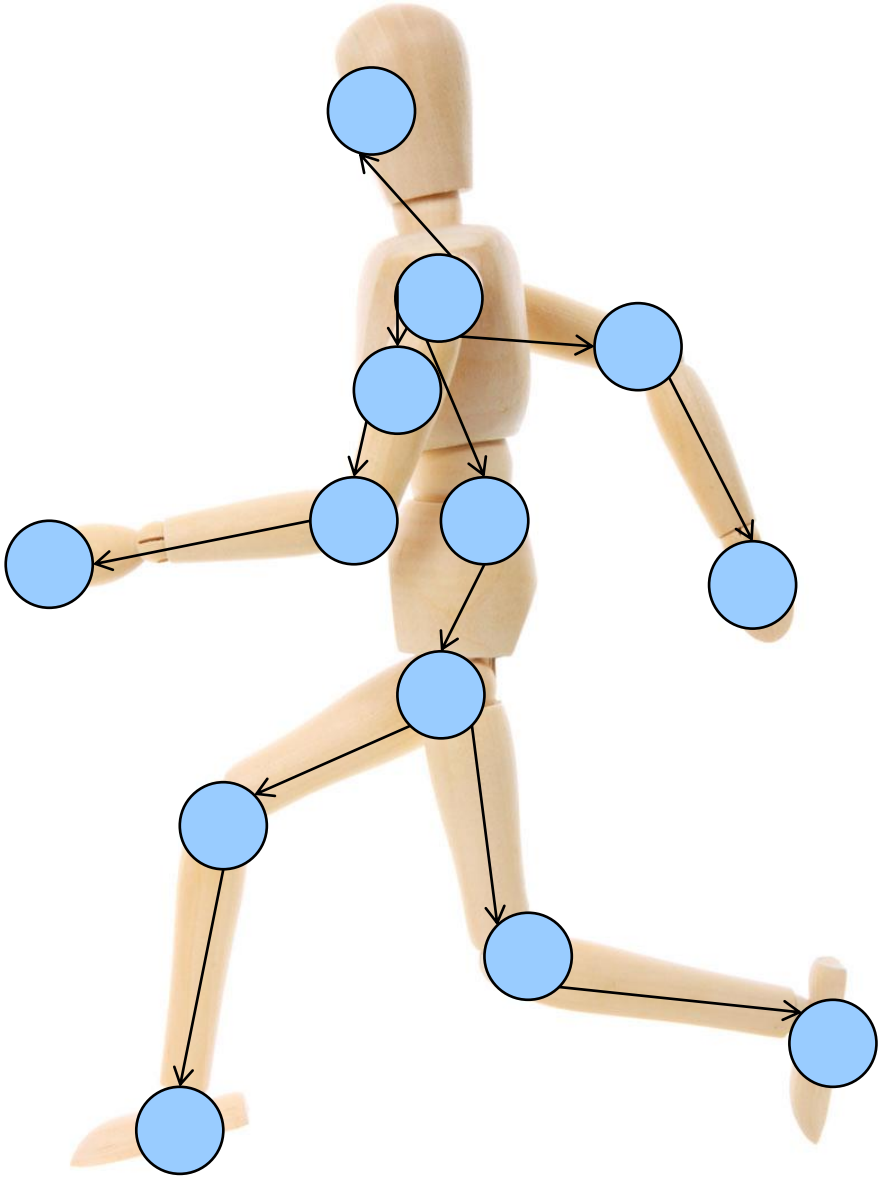

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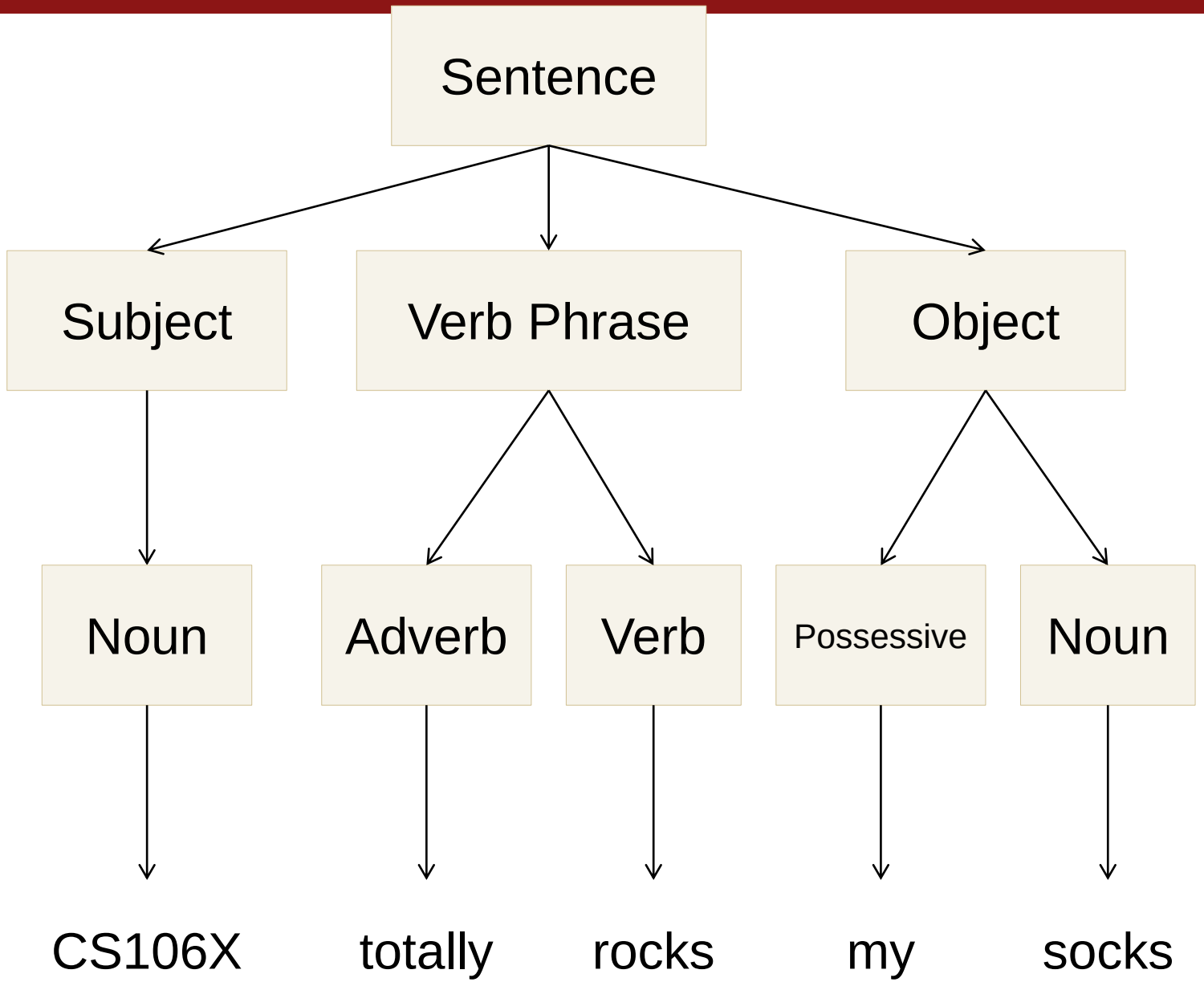
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Object
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Adverb
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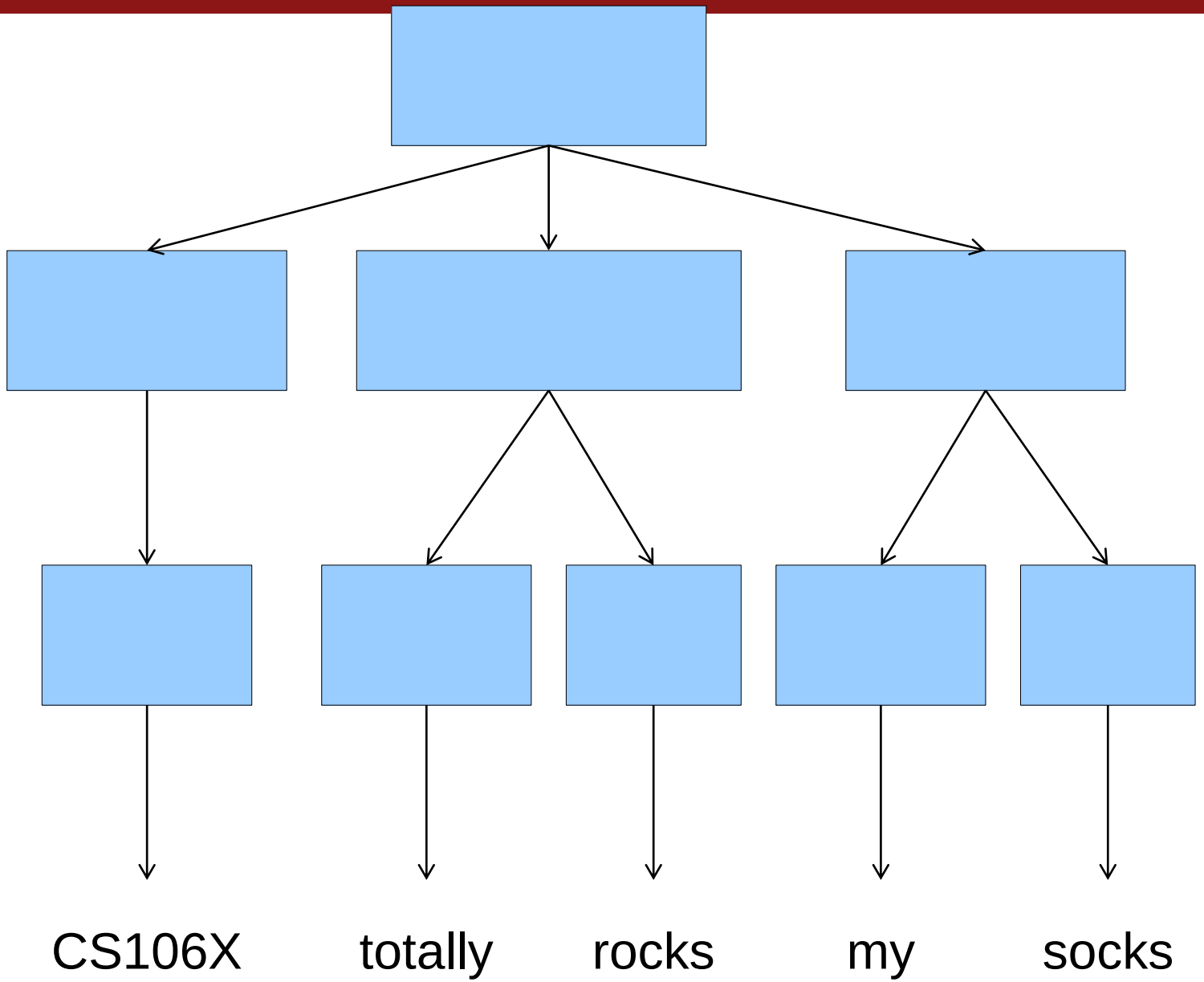
my
socks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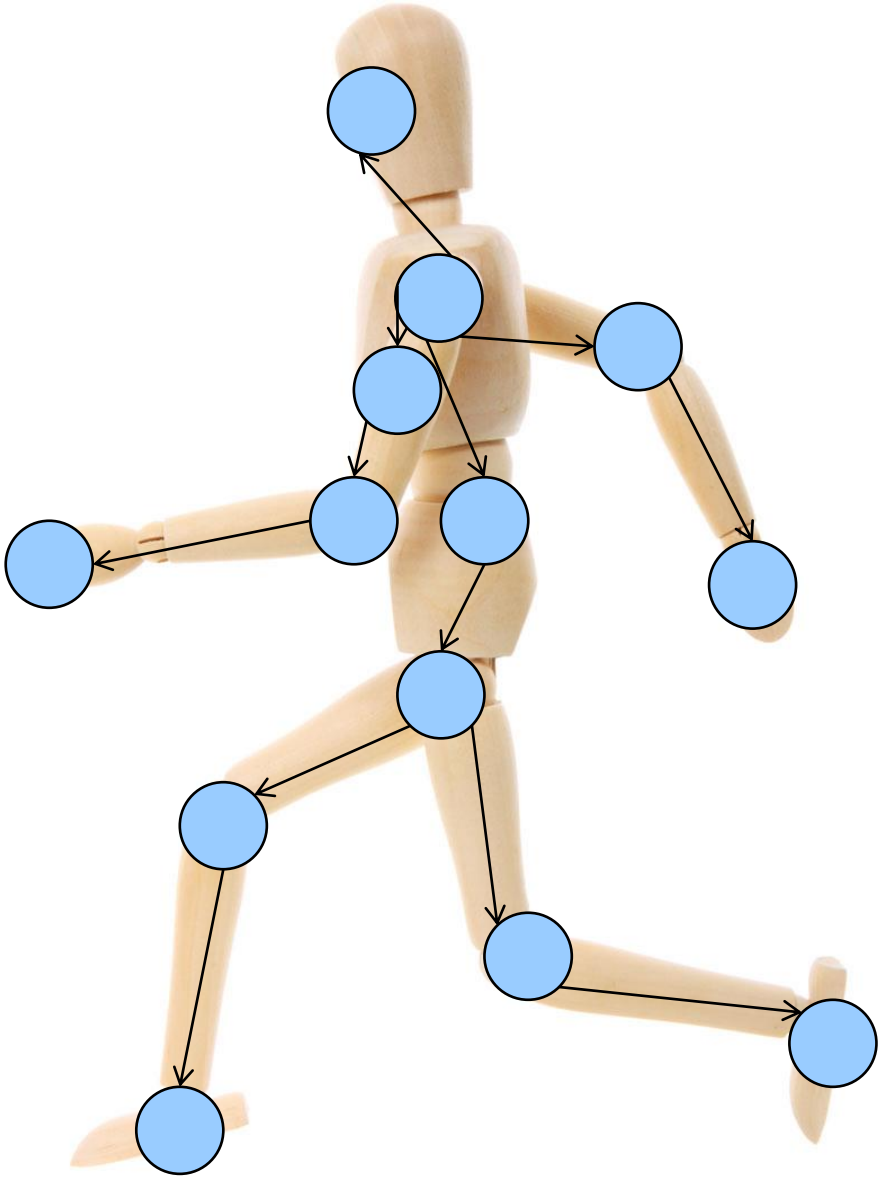

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Building a vocabulary of **ABSTRACTIONS**

makes it possible to represent and solve a huge variety of problems using known tools.

A first C++ program (Error)

firstprogram.cpp

```
#include <iostream>
#include "console.h"
using namespace std;

int main(){
    cout << "|-5| = "
     << absoluteValue(-5)
     << endl;
    return 0;
}
```

```
int absoluteValue(int n) {
    if (n<0){
        return -n;
    }
    return n;
}
```