

Course Overview

CS520*

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My Goals for the Course

- **Pull back the curtain and show you the hardware and software platforms on which high-level programs execute.**
- **Convince you that this is important.**
- *Convince you that this is cool!*

Might be life changing!

- I was a math major.
- Studying “pure mathematics”.
- **Until this course corrupted me!**
- I finished the math major.
- But ended up doing my MS and PhD in CS.

There's more to life than Java.

“I was kind of freaked out when I realized that there are people graduating with CS degrees who'd never written C. They started in Java and they stayed there. That just seemed bizarre and wrong.” —**Jamie Zawinski, early Netscape/Mozilla developer.**

Knowledge is power.

*“I see people that are really smart—I would say they're good programmers—but say they only know Java. The way they think about solving things is always within the space they know. They don't think end-to-end as much. **I think it is really important to know the whole stack** even if you don't operate within the whole stack.”*

(continued on next slide)

*“There are all these beautiful abstractions that are backed by shit. The implementation of libraries that look like they could be beautiful are shit. And so if you're the one responsible for the cost of buying servers, or reliability—if you're on call for pages—**it helps to actually know what's going on under the covers** and not trust everyone else's libraries, and code, and interfaces.” —**Brad Fitzpatrick, creator of Livejournal.***

- The quotes are from **“Coders at Work: Reflections on the Craft of Programming”** by **Peter Seibel**.
- If you are serious about programming, I recommend reading it.
- It contains interviews with 15 master programmers.

Career Distinguisher

- I used to make my living as a COBOL programmer.
- **Most of my co-workers only knew COBOL.**
- People lined up at my desk when something went wrong with the computing environment.
- **My boss definitely noticed.**

UNH CS Industry Advisory Board

- Only willing for CS to move to “Java first”, if
 - C programming was still taught
 - Students learned about “real pointers”
 - Students learned about allocating and deallocating memory “by hand”
- They also pushed the department to increase the emphasis on threaded programming.

My Credentials

- Have taught at UNH since Fall 1986.
- **Have taught this course since Fall 1987.**
- Relevant projects:
 - UNH Dataparallel C compiler
 - UNH C* compiler
 - Hyperion (Java VM for a cluster of computers)
 - ExPosé VM (low-level VM w/memory annotations)

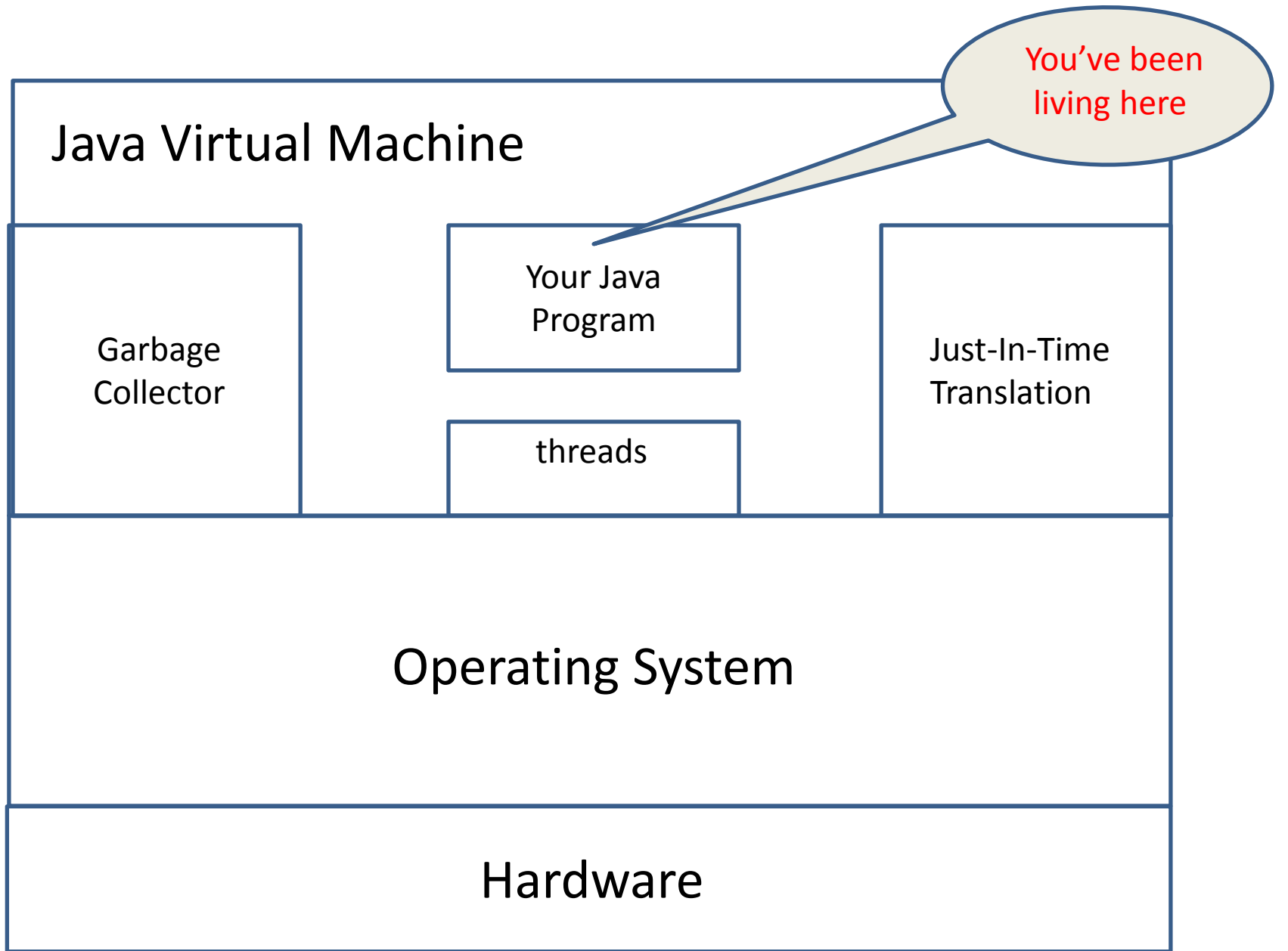
Your Credentials

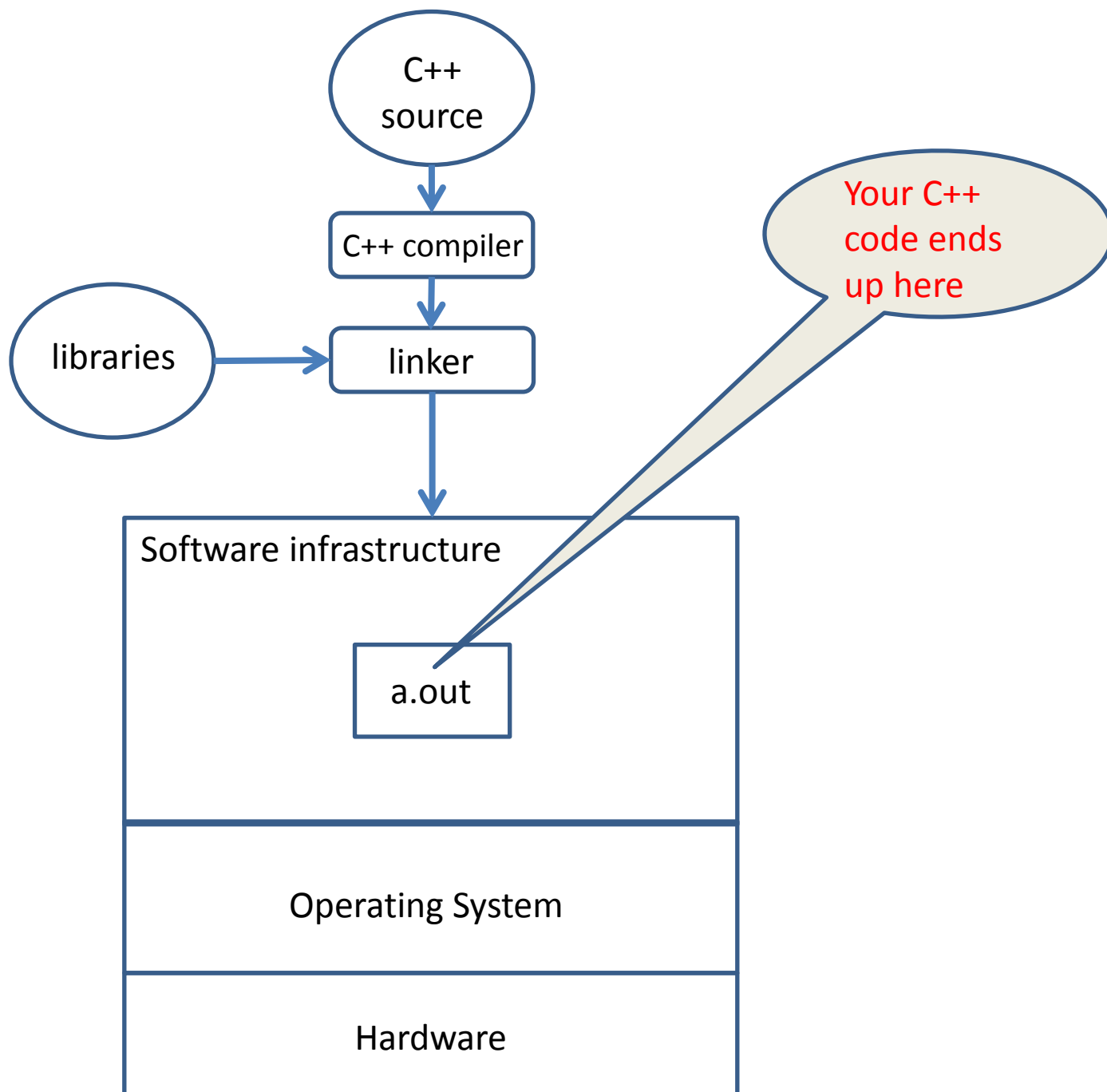
- Completed CS415 and CS416.
- Know basic data structures: linked lists, stacks and queues.
- Best if you have completed CS515*.
- In some cases it might be possible to take CS515 and CS520 at the same time.
 - But I assume you have programmed using C++.
 - You must be ready for the intensity level of the course.

* CS515 is the formal prerequisite for CS520.

Course Topics

- Basics of computer architecture
- Data and program representation
- Assembly language programming
- C programming
- Multithreaded programming
- Historical perspectives





And...

- **Develop professional programming habits:**
 - Code layout
 - Code documentation
 - Testing
 - Debugging
- **Build confidence and independence:**
 - Strengthen ability to solve your own problems.

Next.....

- Be sure to visit the course website:
www.cs.unh.edu/~cs520