

This is
EECS 183

[https://www.youtube.com/watch?
v=fclzGfU4HIU](https://www.youtube.com/watch?v=fclzGfU4HIU)

Welcome to
EECS 183

Time for Introductions

So, what is
EECS 183?

Elementary Programming Concepts

Elementary Programming Concepts

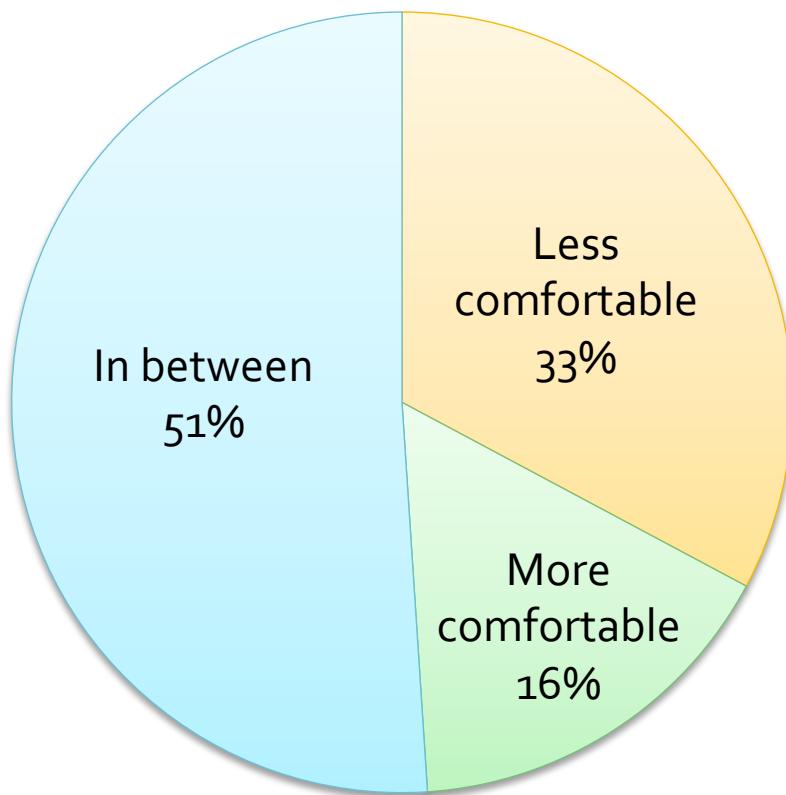
Survey Results:

71%



EECS 183 F'15 students with no prior CS experience

Comfort Level



EECS 183 Showcase W'15

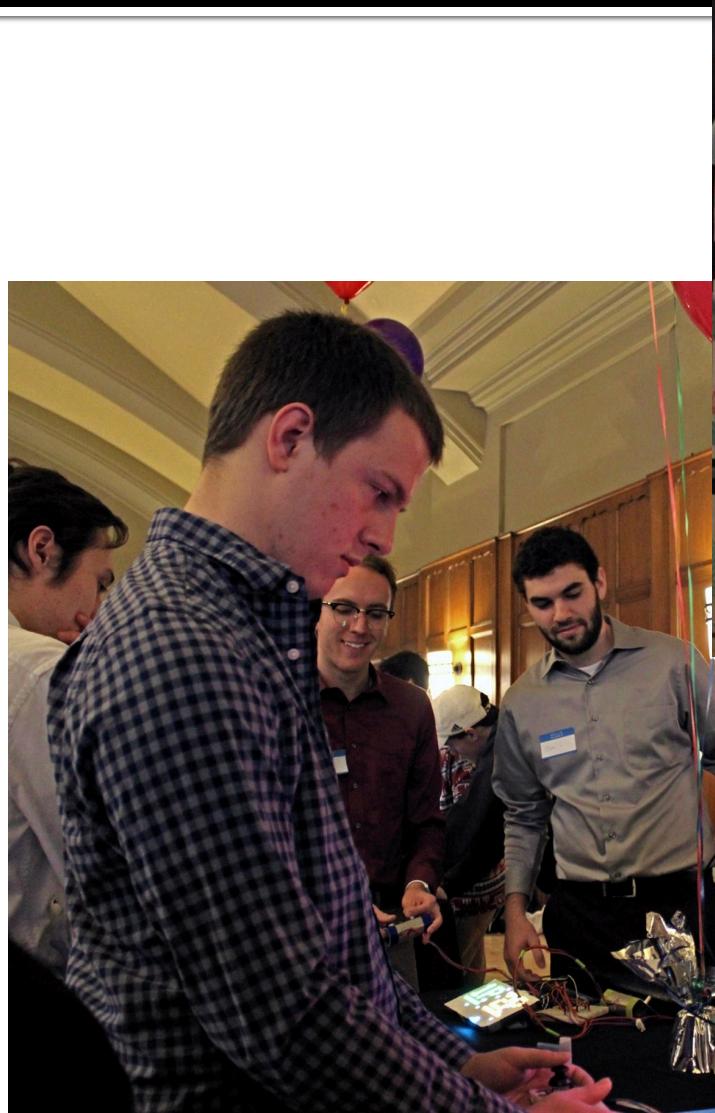


EECS 183 Showcase F'15

- Creative AI
- iOS
- Web Scheduler
- Arduino Micro Arcade



EECS 183 Showcase F'15



Company Sponsored



EECS 183 Showcase F'15

Sponsors

- JP Morgan Chase
- Stryker
- Wolverine Trading
- Epic
- NCWIT
- Farmlogs
- Akuna Capital
- WorkForce Software
- Digital Innovation Group
- M innovate blue

EECS 183 Showcase F'15

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- M innovate blue

Several Companies will be contacting multiple students for possible internships

Question: what other course can you get an internship from with exactly ONE course?

Elementary Programming Concepts

Programming is...

Collaborative Problem-Solving

Programming is...

Collaborative Problem-Solving

Between a Person and a Computer

People + Computers

Computers are:

- Fast
- Accurate
- Dumb as Bricks

People + Computers

Computers are:

- Fast
- Accurate
- Dumb as Bricks

People are:

- Slow
- Inaccurate
- Brilliant

People + Computers = Awesome!

Computers are:

- Fast
- Accurate
- ~~Dumb as Bricks~~

People are:

- Slow
- Inaccurate
- Brilliant

What is Computer Science?

Computer Scientists

- let the experts explain

<https://www.youtube.com/watch?v=nKlugyen5nc>

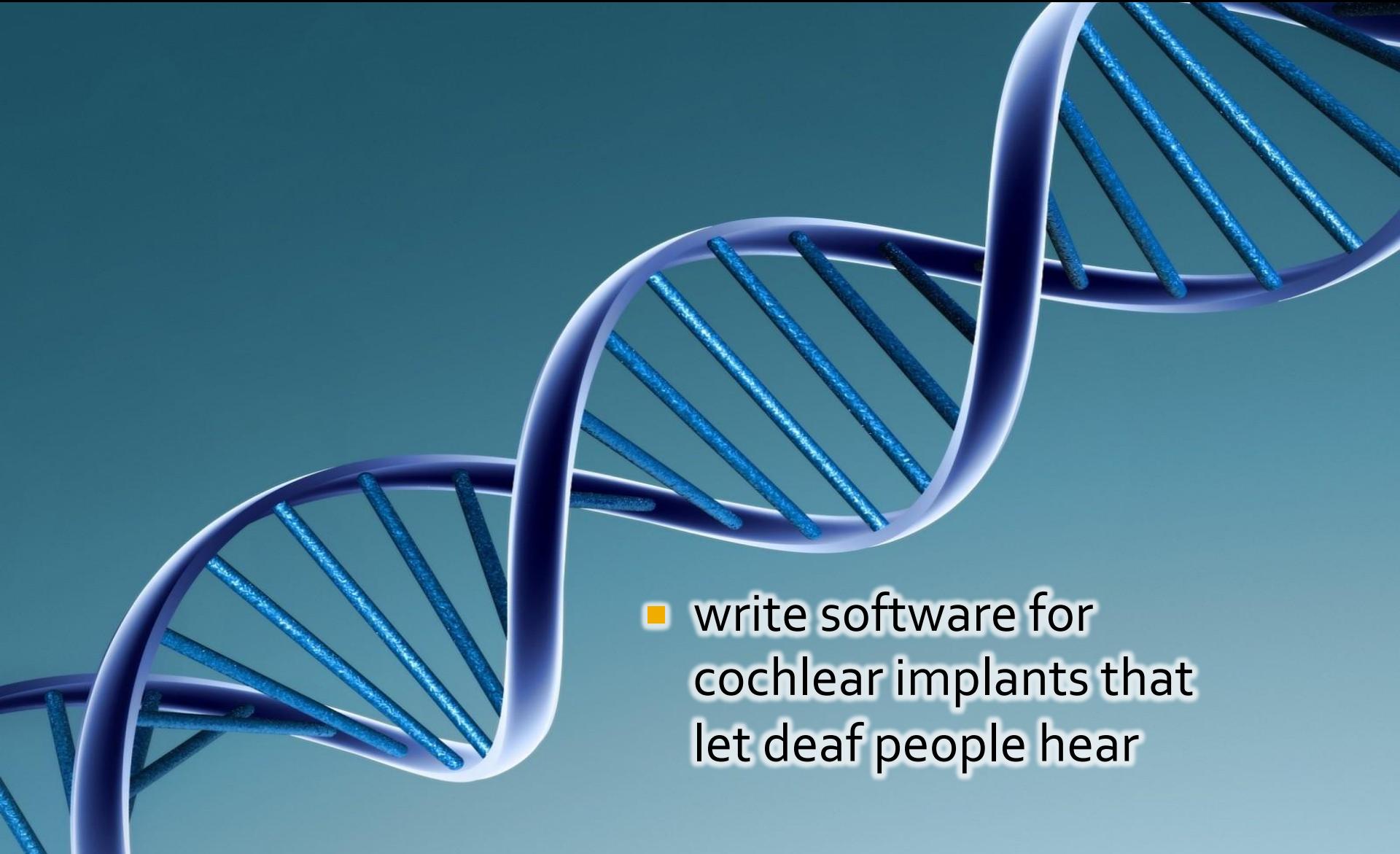
What's the Job Market Like?

■ Reality

- Not enough students for jobs available
- CS students are highly sought after

Programming
is used
Everywhere

CS is in Medicine

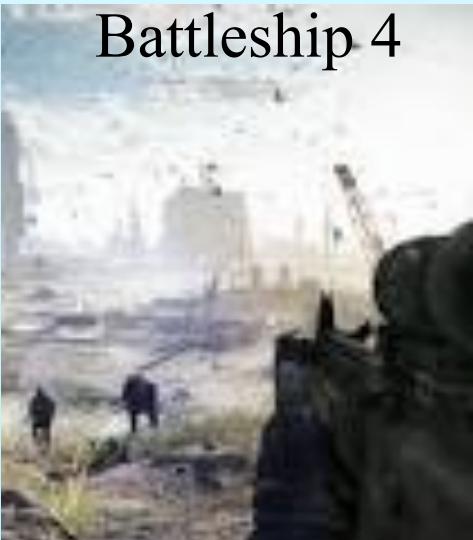


- write software for cochlear implants that let deaf people hear

CS is in Transportation



CS is in entertainment



CS is in Social Good

A photograph of a person's hand reaching out towards the right. The background is a light yellow color and is covered with a dense pattern of blue digital icons, including hearts, envelopes, arrows, and other communication symbols.

create secure databases for recording human rights abuses while shielding victim and witness identities

- create clothing that
- helps prevent SIDS in infants
 - aids blind people in navigating their environment

CS is in Finance

- Wall Street
- Real-time Risk Evaluation
- High Frequency Trading
- Automated Portfolio Construction and Indexing
- Game Theory Models

SOCIAL MEDIA for SOCIAL GOOD

A hand wearing a brown sleeve and a black tie is holding a white tray. On the tray are several stacks of golden-yellow cookies. Each cookie has a different social media logo on it, such as Facebook, Twitter, LinkedIn, and Pinterest. The background is a solid teal color.

create tools that help ordinary people
collect extraordinary amounts of money
for important causes

CS Makes Life Easier and More Enjoyable – the future



Drones for delivery:
Amazon, UPS and Google



Star Wars-style phone calls
3D holographic image of person
on other end of call

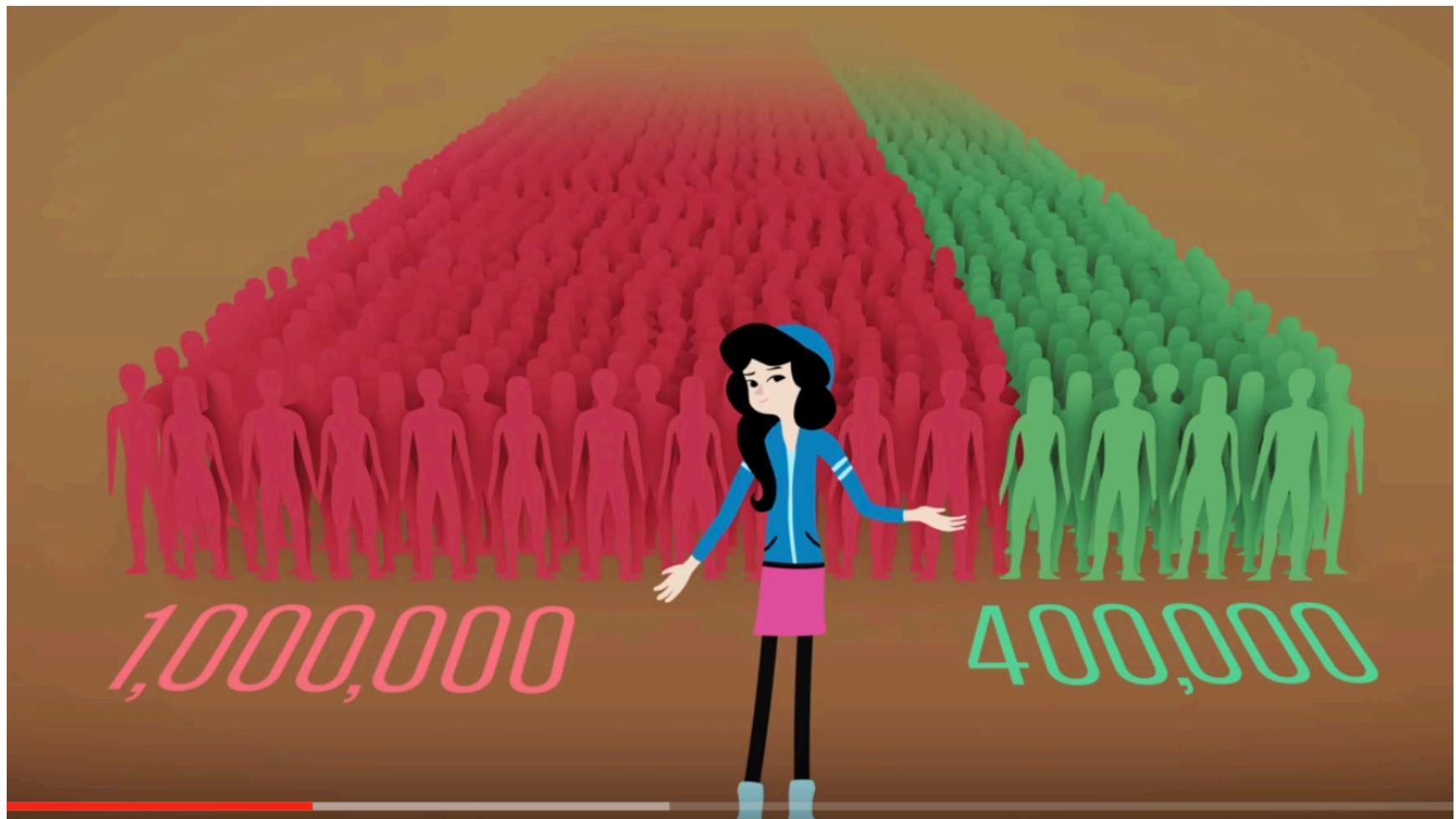
Profession that use/apply CS

- Scientist
- Doctor
- Business professional
- Financial analyst
- Etc, etc, etc, etc

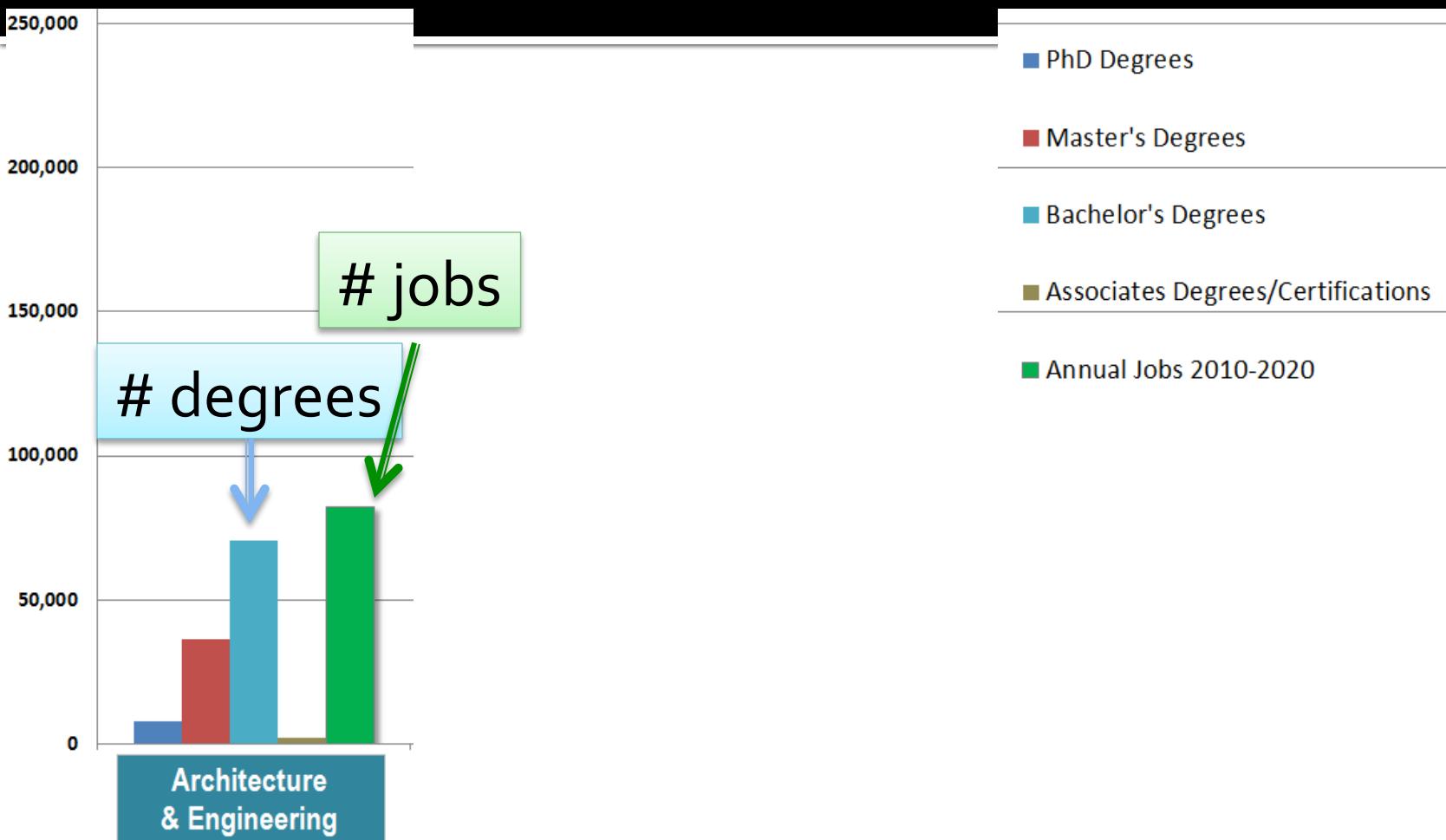
Profession that will NOT use/apply CS

- Work with the people around you to come up with one
 - Note:
 - name
 - uniqname
 - tidbit about that other person

What's the Job Market Like?

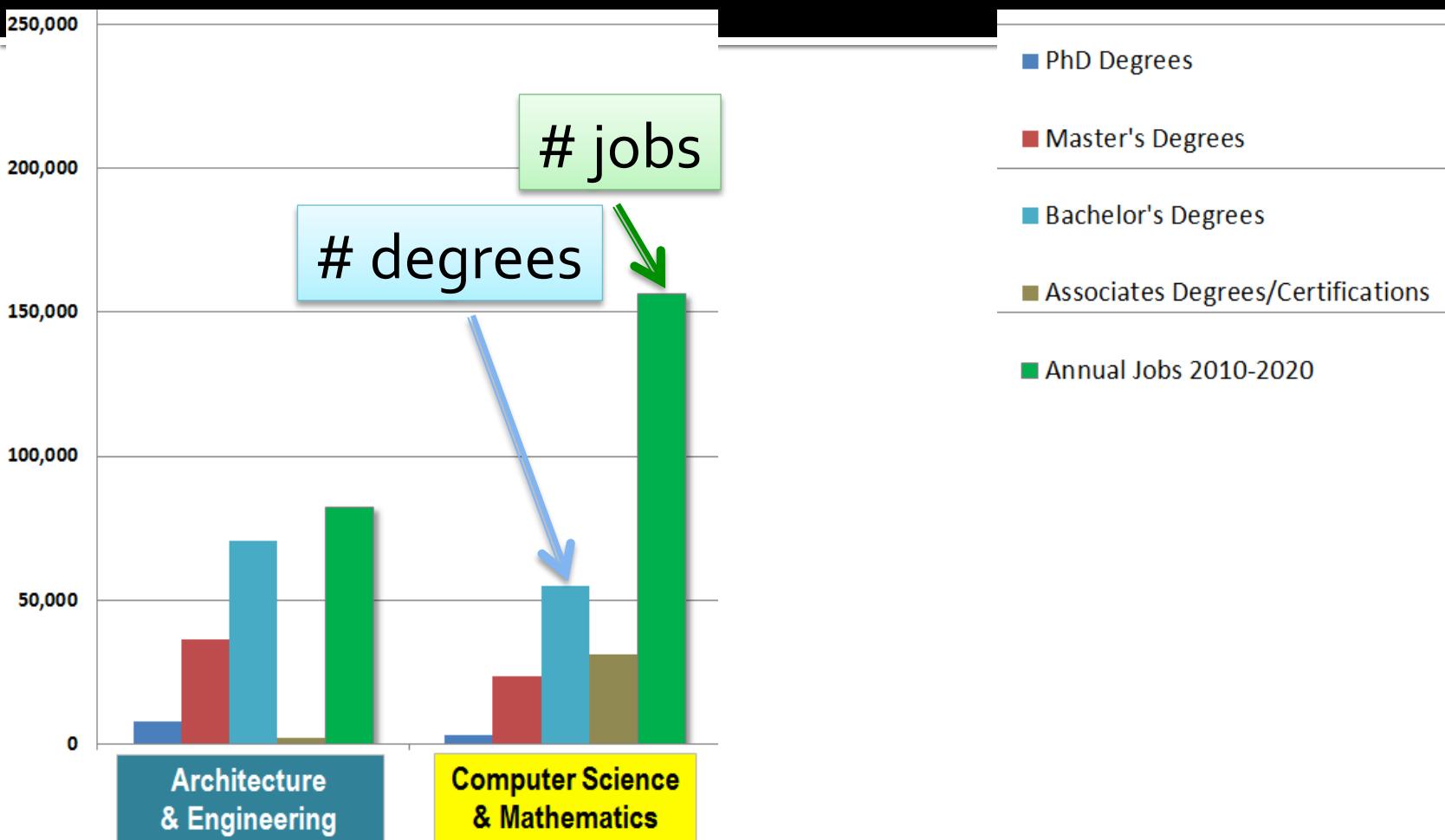


Degrees vs. Jobs Annually



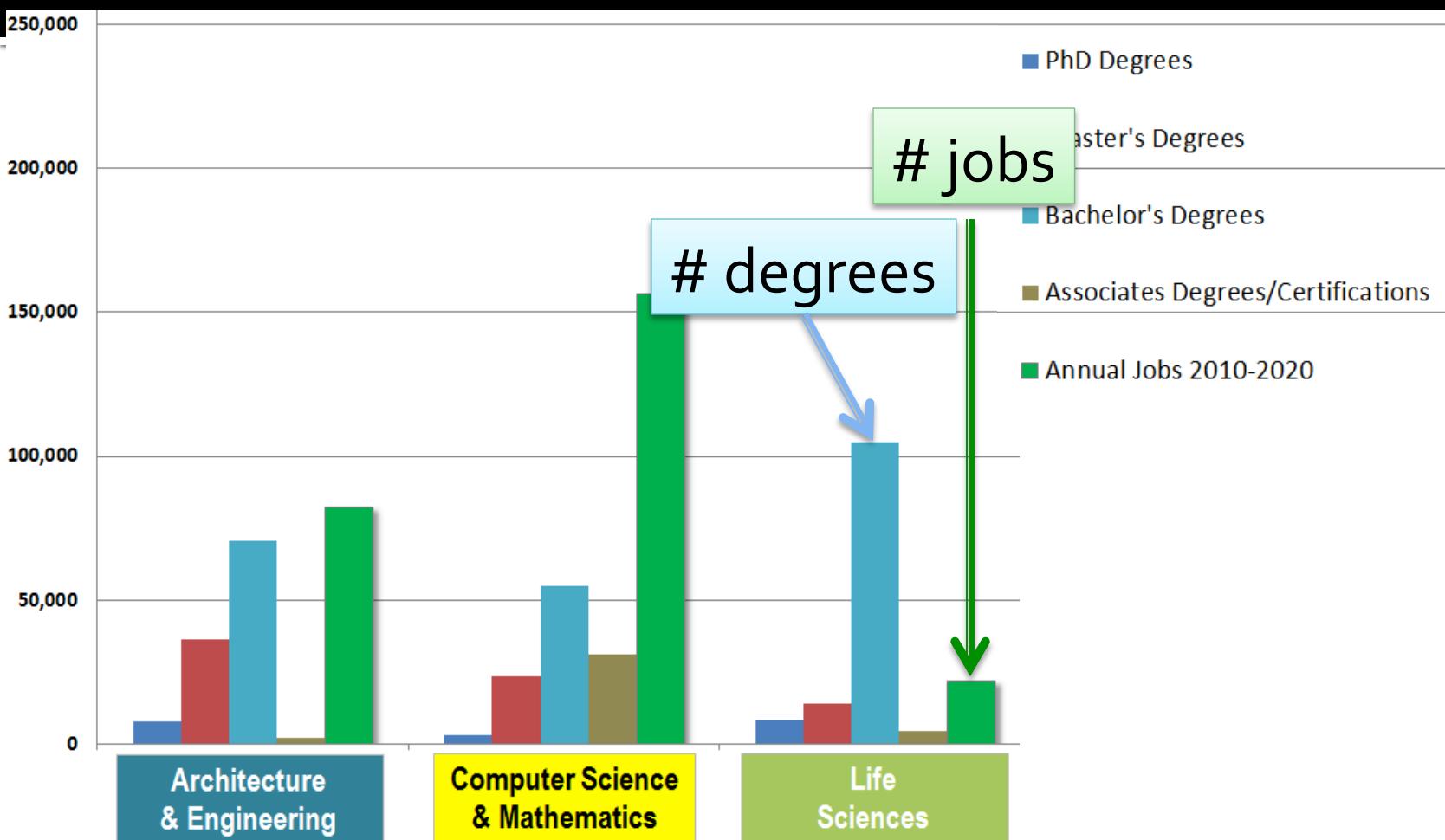
Sources: Degree data are calculated from the National Science Foundation (NSF), Science and Engineering Indicators 2012, available at <http://www.nsf.gov/statistics/seind12/appendix.htm>. Annual jobs data are calculated from the Bureau of Labor Statistics (BLS), Employment Projections 2010-2020, available at <http://www.bls.gov/emp/>. STEM is defined here to include non-medical degrees and occupations.

Degrees vs. Jobs Annually



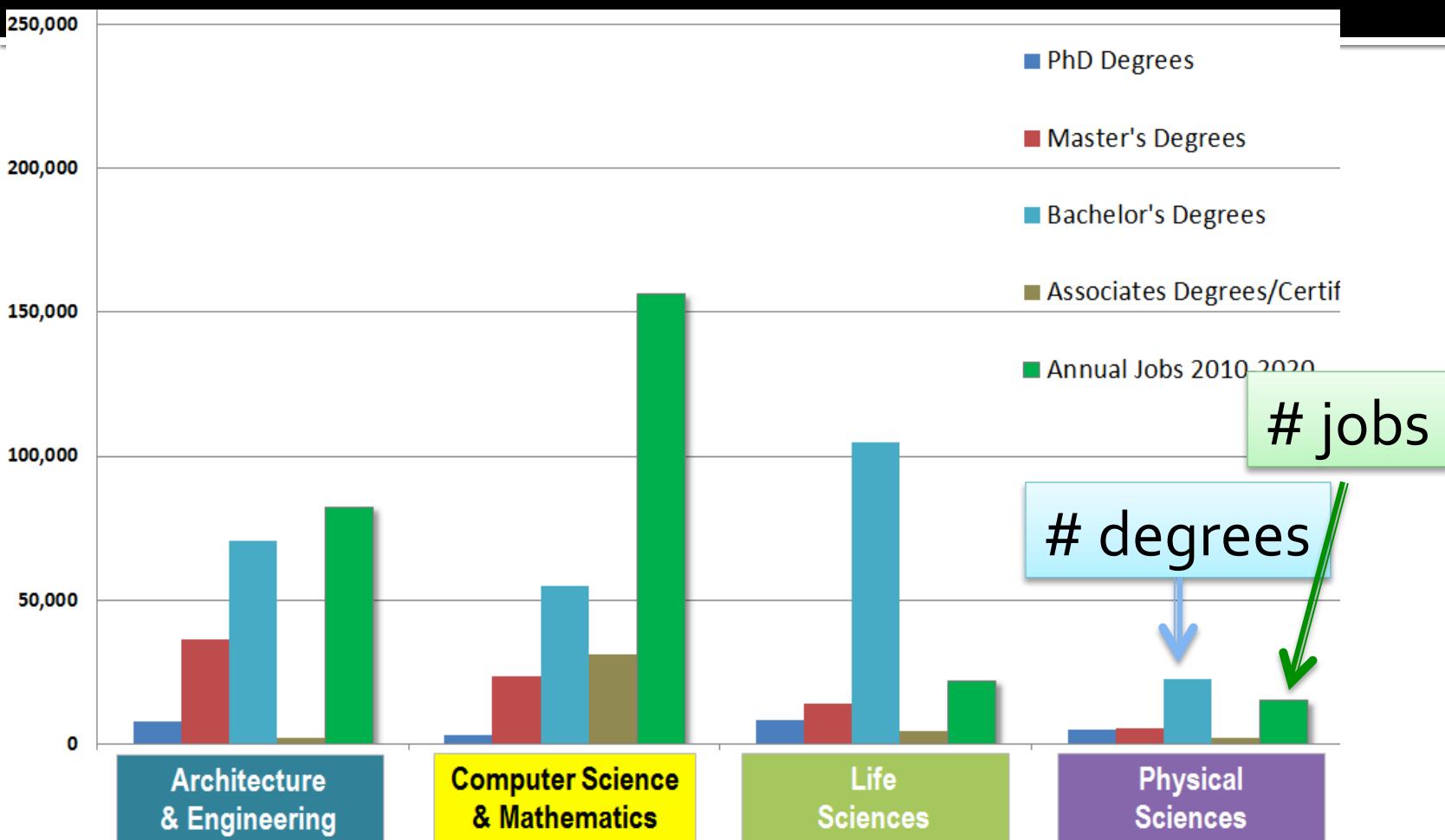
Sources: Degree data are calculated from the National Science Foundation (NSF), Science and Engineering Indicators 2012, available at <http://www.nsf.gov/statistics/seind12/appendix.htm>. Annual jobs data are calculated from the Bureau of Labor Statistics (BLS), Employment Projections 2010-2020, available at <http://www.bls.gov/emp/>. STEM is defined here to include non-medical degrees and occupations.

Degrees vs. Jobs Annually



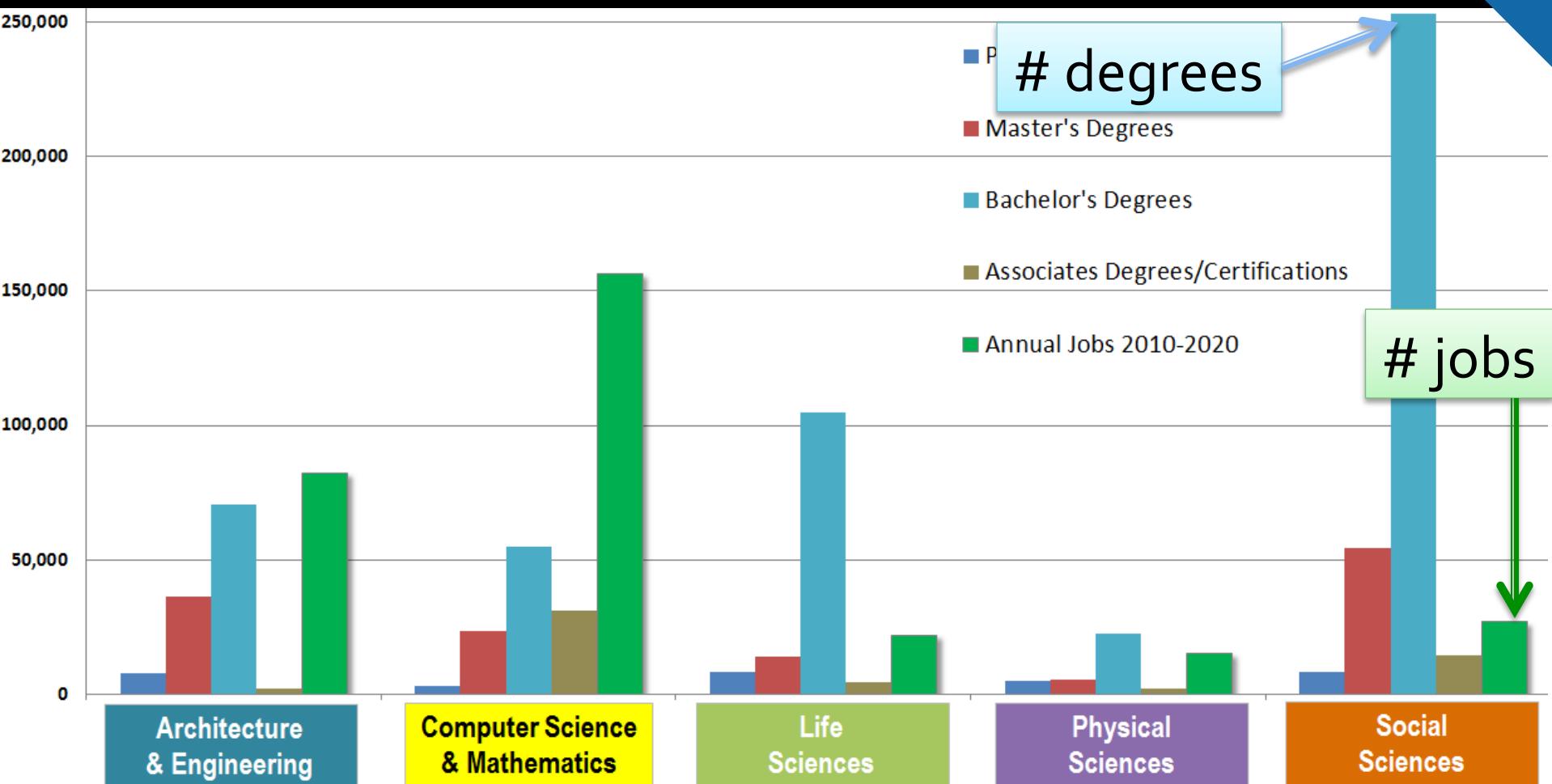
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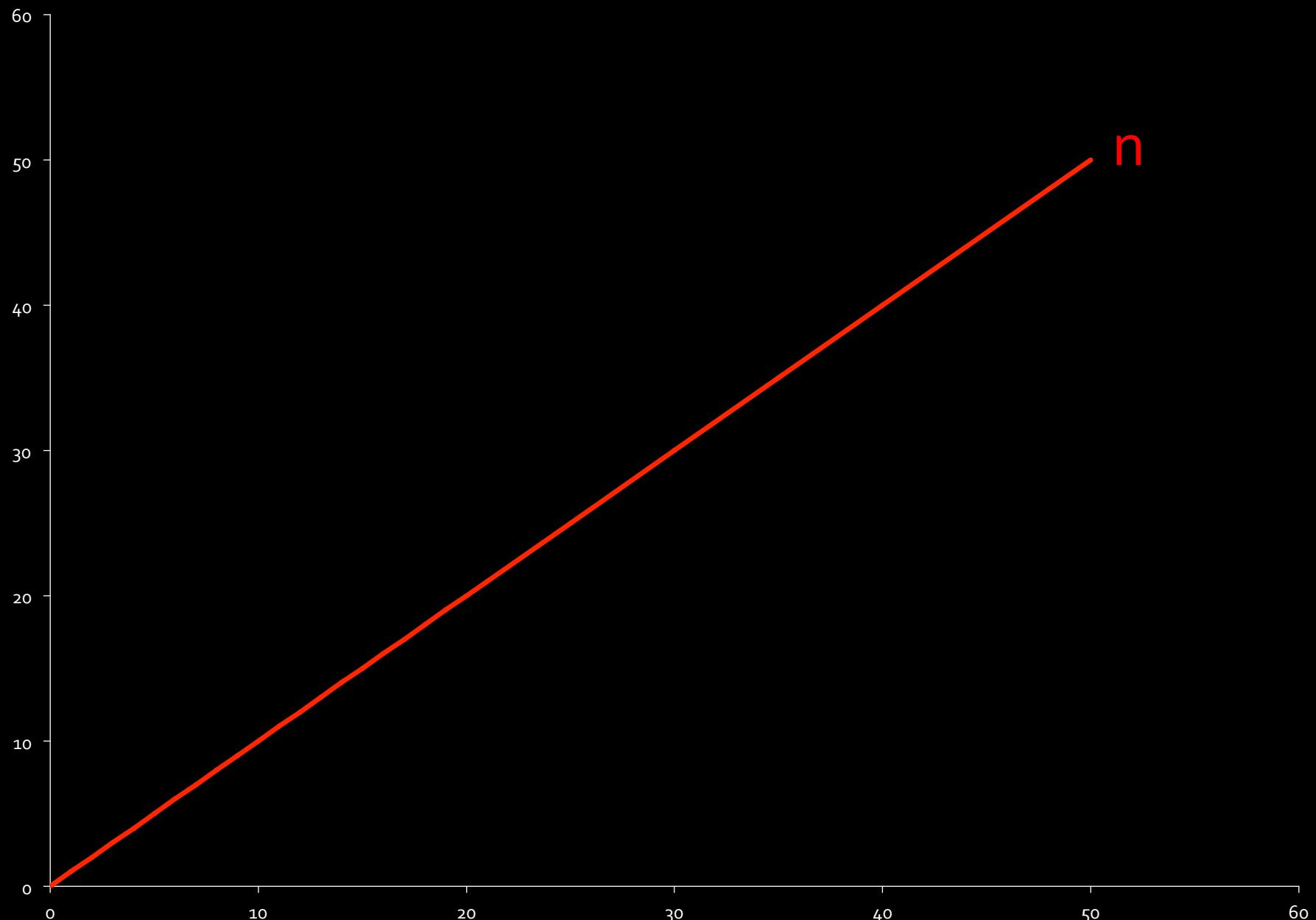
Elementary Programming Concepts

Algorithms

What is an algorithm?

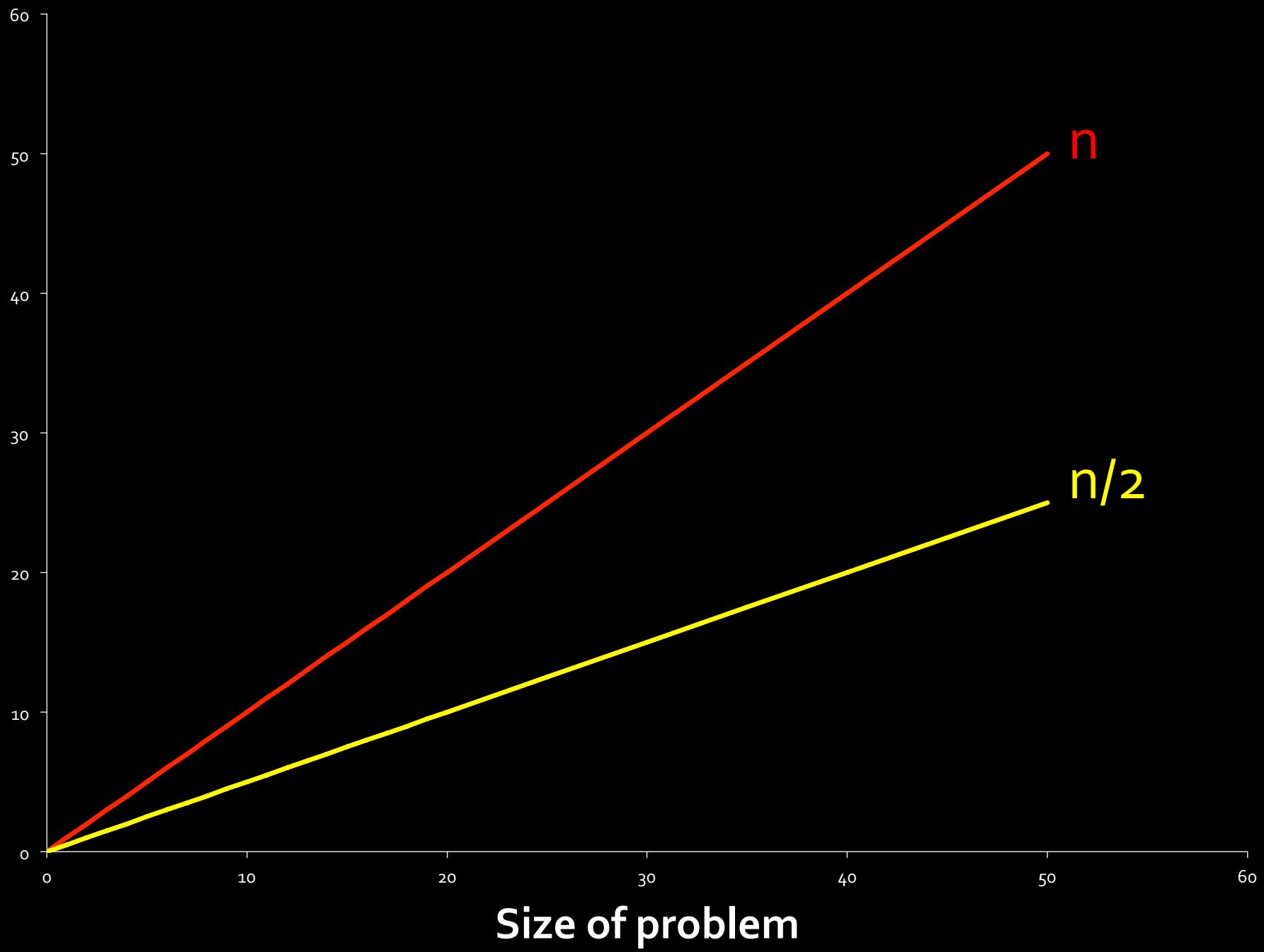
- <http://ed.ted.com/lessons/your-brain-can-solve-algorithms-david-j-malan>

Time to solve



n

Time to solve



Counting Students in the Room

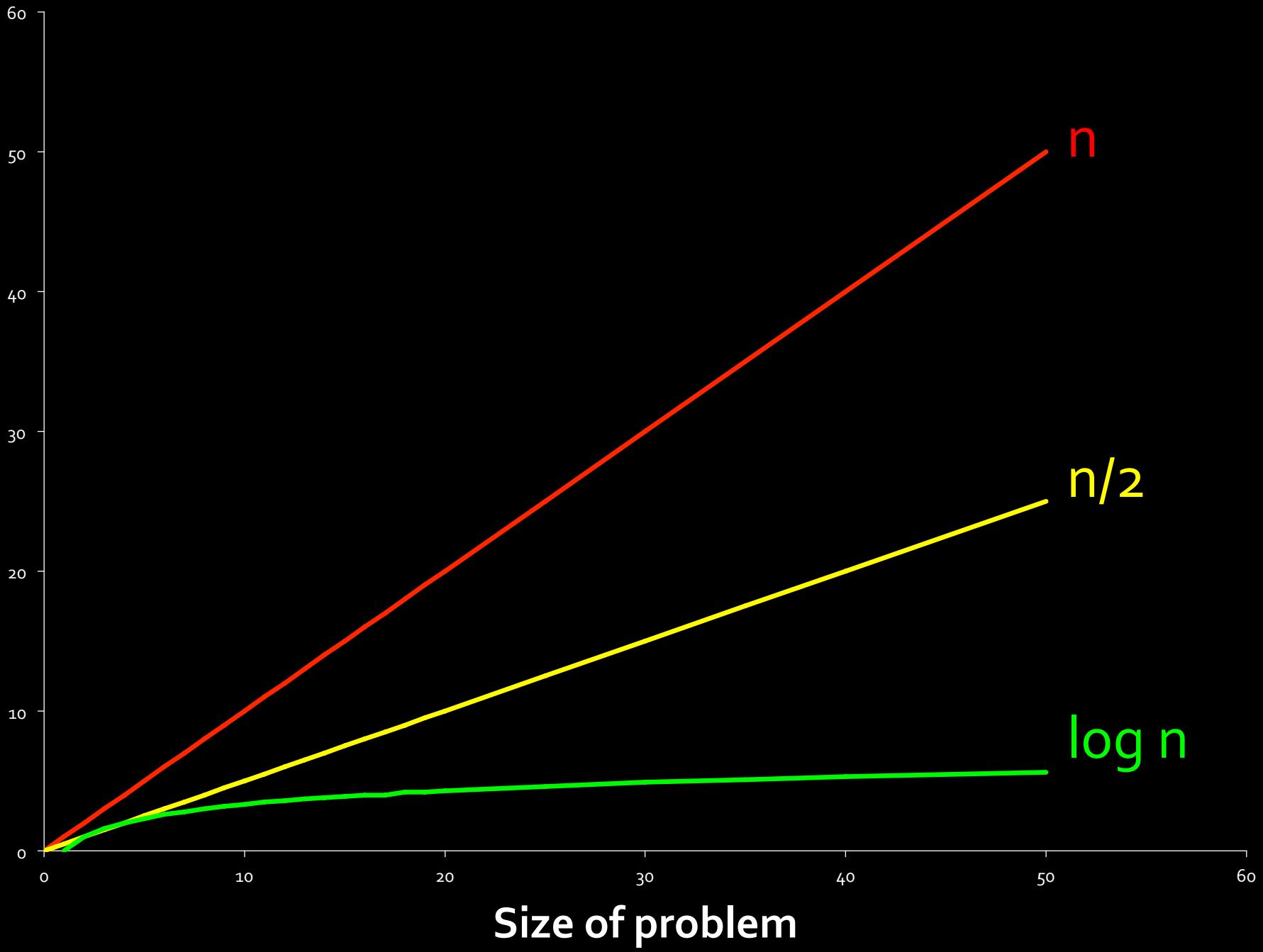
Everyone please stand

You each start with the number 1

When I tell you to start:

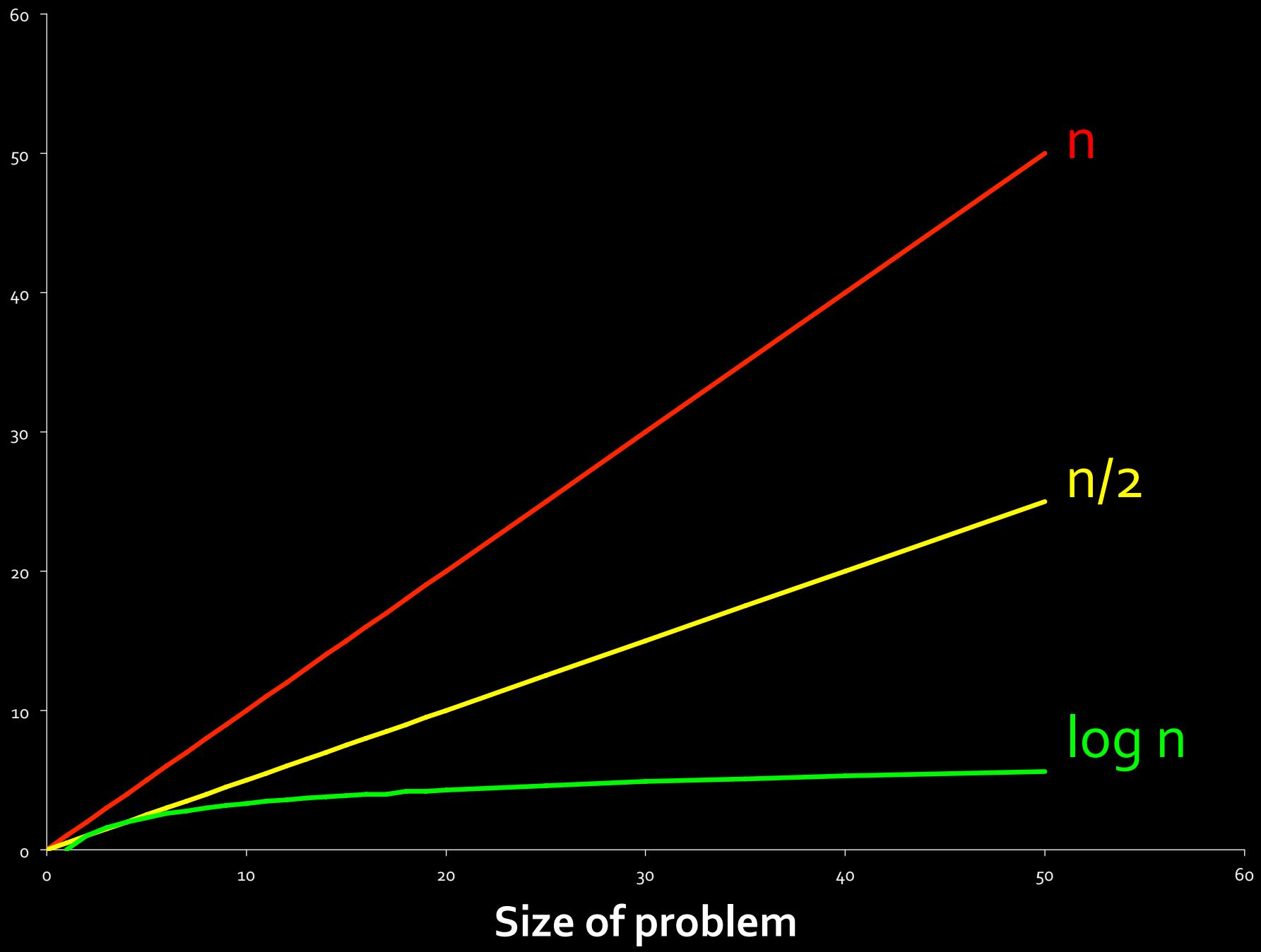
1. Find another person standing
2. Add your two numbers together
3. One of you sit down
4. Repeat!

Time to solve



Searching a Phone Book

Time to solve



EECS 183: Elementary Programming Concepts

Discussion Sections

Two kinds of discussion sections:

- Regular
 - Little or No Prior Experience
- Advanced
 - Some Prior Programming Experience

Find a section that works for you!

Zyante On-line Book

https://zybooks.zyante.com/#/zybook/UMichFall2014/chapter/1/section/1

ZYANTE

Home 

1. Intro

1.1 Programming

- 1.2 First program
- 1.3 Basic output
- 1.4 Basic input
- 1.5 Comments / spaces
- 1.6 Errors/warnings
- 1.7 About this material
- 1.8 Prog: Output art
- 1.9 Computers and programs
- 1.10 Computer tour
- 1.11 Language history

2. Vars/Assignments

2.1 Variables (int)

2.2 Assignments

Contact us at support@zyante.com

Mary Lou Dorf | My zyBooks | Sign In

1.1 Programming

A recipe consists of *instructions* that a chef executes, like adding eggs or stirring ingredients. Likewise, a **computer program** consists of instructions that a computer executes (or *runs*), like multiplying numbers or printing a number to a screen.

Add instructor

Figure 1.1.1: A program is like a recipe.



The following simple computer program calculates the amount to pay an employee.

Activity 1.1.1: A first computer program.

Run the program and observe the output. Click and drag the instructions to change their order, and run the program again. Can you make the program output 300?

Run program

www.zyante.com

\$25.00 for semester

<https://eecs183.org/docs/zyante>

CodeLab – short exercises

www.tcgo1.com

\$25.00 per year

<https://eeecs183.org/docs/codelab>

The screenshot shows a web browser displaying the Turing's Craft website (www.turingscraft.com). The main content area is titled "CodeLab®: A Powerful Tool for Programming Instruction". It features a programming exercise for C++ arrays. The exercise ID is 10618, and the task is to declare an array named `a` and assign 3 to its first element. Below the text input field, there is a "GLOSSARY LINKS: a" button. To the right of the input field are "PREVIOUS" and "NEXT" buttons. On the far right, there are three callout boxes: one for instructors, one for students, and one for users.

iClicker



Starts **next** Wednesday

50% correct needed for point

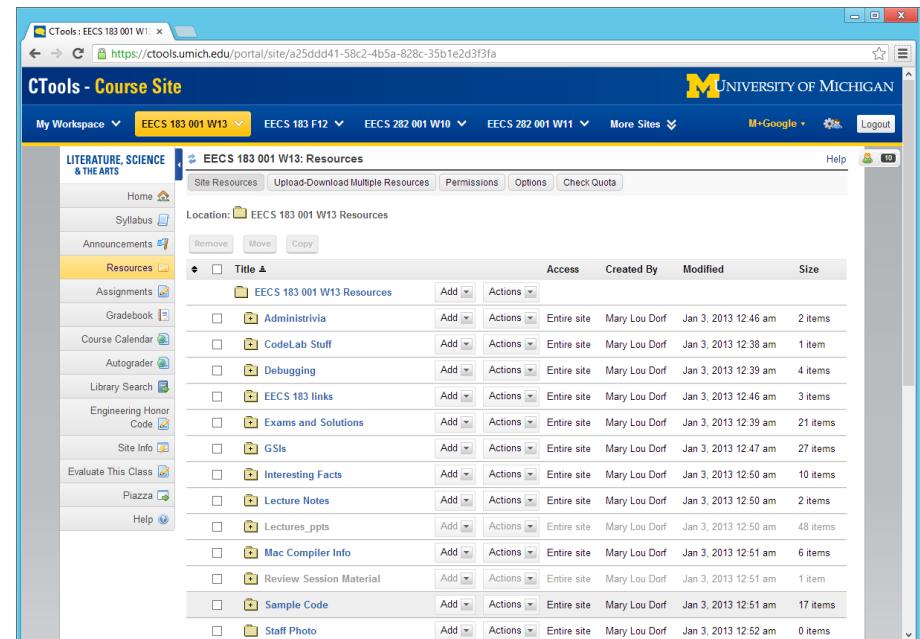
\$33 @ U-M Computer Showcase

Register at:

<https://eeecs183.org/iclicker/>

Course Administration

- Primary Course Portal:
<https://eeecs183.org>
 - Syllabus: Policies & Procedures
 - Course Schedule
 - Lecture Slides
 - Past Exams
 - Sample Code
 - Assignments
 - Links



The screenshot shows a web browser window titled "CTools - Course Site" for the course "EECS 183 001 W13". The URL in the address bar is <https://ctools.umich.edu/portal/site/a25ddd41-58c2-4b5a-828c-35b1e2d3f3fa>. The page header includes the University of Michigan logo and links for other courses like EECS 183 F12, EECS 282 001 W10, and EECS 282 001 W11. On the left, a sidebar menu lists "LITERATURE, SCIENCE & THE ARTS" with links for Home, Syllabus, Announcements, Resources (which is selected), Assignments, Gradebook, Course Calendar, Autograder, Library Search, Engineering Honor Code, Site Info, Evaluate This Class, Piazza, and Help. The main content area is titled "EECS 183 001 W13: Resources" and shows a table of resources. The table has columns for Title, Access, Created By, Modified, and Size. The resources listed include:

Title	Access	Created By	Modified	Size
EECS 183 001 W13 Resources	Add	Mary Lou Dorf	Jan 3, 2013 12:46 am	2 items
Administrivia	Add	Mary Lou Dorf	Jan 3, 2013 12:39 am	1 item
CodeLab Stuff	Add	Mary Lou Dorf	Jan 3, 2013 12:39 am	4 items
Debugging	Add	Mary Lou Dorf	Jan 3, 2013 12:39 am	4 items
EECS 183 links	Add	Mary Lou Dorf	Jan 3, 2013 12:46 am	3 items
Exams and Solutions	Add	Mary Lou Dorf	Jan 3, 2013 12:39 am	21 items
GSlis	Add	Mary Lou Dorf	Jan 3, 2013 12:47 am	27 items
Interesting Facts	Add	Mary Lou Dorf	Jan 3, 2013 12:50 am	10 items
Lecture Notes	Add	Mary Lou Dorf	Jan 3, 2013 12:50 am	2 items
Lectures_ppts	Add	Mary Lou Dorf	Jan 3, 2013 12:50 am	48 items
Mac Compiler Info	Add	Mary Lou Dorf	Jan 3, 2013 12:51 am	6 items
Review Session Material	Add	Mary Lou Dorf	Jan 3, 2013 12:51 am	1 item
Sample Code	Add	Mary Lou Dorf	Jan 3, 2013 12:51 am	17 items
Staff Photo	Add	Mary Lou Dorf	Jan 3, 2013 12:52 am	0 items

Assignment 0– Due Friday

- Lecture Problem Initial survey
- Hour of Code
- 183Coach Common Survey
- Initial Survey

Meet the Staff

- Come meet the staff!
- Time: Sunday, January 10th at 6:00 pm
- Location: 1800 CHEM

- Get help setting up your laptop
 - Visual Studio – PC
 - Xcode - MAC

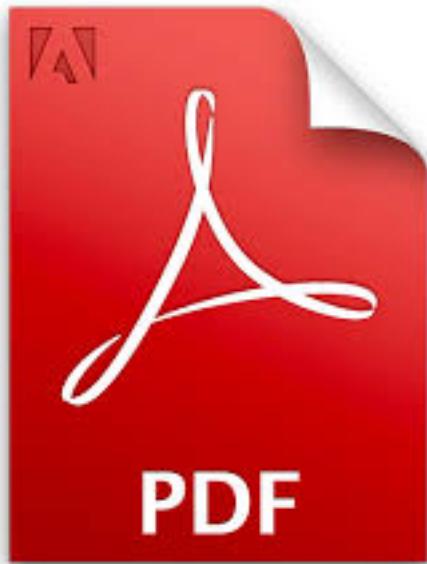
Course Schedule

- Topics of lectures
- Required Readings
- Deadlines

The screenshot shows a Google Sheets spreadsheet titled "Course Schedule". The spreadsheet has a header row with columns for Day, Topics, Required reading, and Recommended reading. Rows 1 and 2 are labeled "Week 1" and "Week 2" respectively. Row 3 contains the text "Discussion sections will NOT meet this week." Row 4 lists "Wed 1/7 L01 Course logistics. What is 183? What is CS? Algorithms. "Hello World" in C++." and provides a link to the "Course Syllabus". Row 5 lists "Fri 1/9 Hour of Code and Initial Survey due (umich.edu/~eecs183/surveys/initial)". Row 6 is labeled "Week 2". Row 7 lists "Sun 1/11, 6pm Tutorial: Xcode and Visual Studio (1800 CHEM)". Row 8 lists "Discussion sections will meet starting on Mon 1/12". Rows 9 through 13 list topics for weeks 2 and 3, along with links to Zyante resources and cplusplus.com. Row 14 lists "Fri 1/16 CodeLab due". Row 15 is labeled "Week 3".

A	B	C	D	E
1	Day	# Topics	Required reading	Recommended reading
2	Week 1	Discussion sections will NOT meet this week.		
3	Wed 1/7 L01 Course logistics. What is 183? What is CS? Algorithms. "Hello World" in C++.			
4		Course Syllabus		
5	Fri 1/9	Hour of Code and Initial Survey due (umich.edu/~eecs183/surveys/initial) .		
6	Week 2			
7	Sun 1/11, 6pm	Tutorial: Xcode and Visual Studio (1800 CHEM)		
8	Discussion sections will meet starting on Mon 1/12.			
9	Mon 1/12	L02 Basic I/O. Comments. Source code. Compilers. Xcode. Visual Studio. Object code. Data types. Basic arithmetic. Operators (+, -, *, /, %, =).	Zyante 1.1–1.10	cplusplus.com: Program structure
10				cplusplus.com: Basic I/O
11				cplusplus.com: Variables
12				cplusplus.com: Operators
13	Wed 1/14	L03 Binary. ASCII. Casting. Imprecision. Compile and run-time errors. Libraries. Testing. Debugging. Pre-defined functions.	Zyante 2.1–2.18, 3.1	cplusplus.com: Type conversions
14	Fri 1/16	CodeLab due		
15	Week 3			

Lecture Tools



pdfs of slides
used
► [resources/](#)
[Lecture Notes](#)



Lecture
Recordings
[Lectures](#)

Piazza: Help forum

The screenshot shows the Piazza web interface for a class named 'EECS 183 001 W13'. The left sidebar lists various projects and announcements. The main area displays a post titled 'Introduce Piazza to Your Students' with a message to students about the benefits of using Piazza for class discussion. Below this, there's a section for including a blurb in the syllabus and a link to find the class page.

Piazza – discussion forum
www.piazza.com



Place for information

GREAT Search Capability

Search to see if your question has already been answered

If not, ask

Background

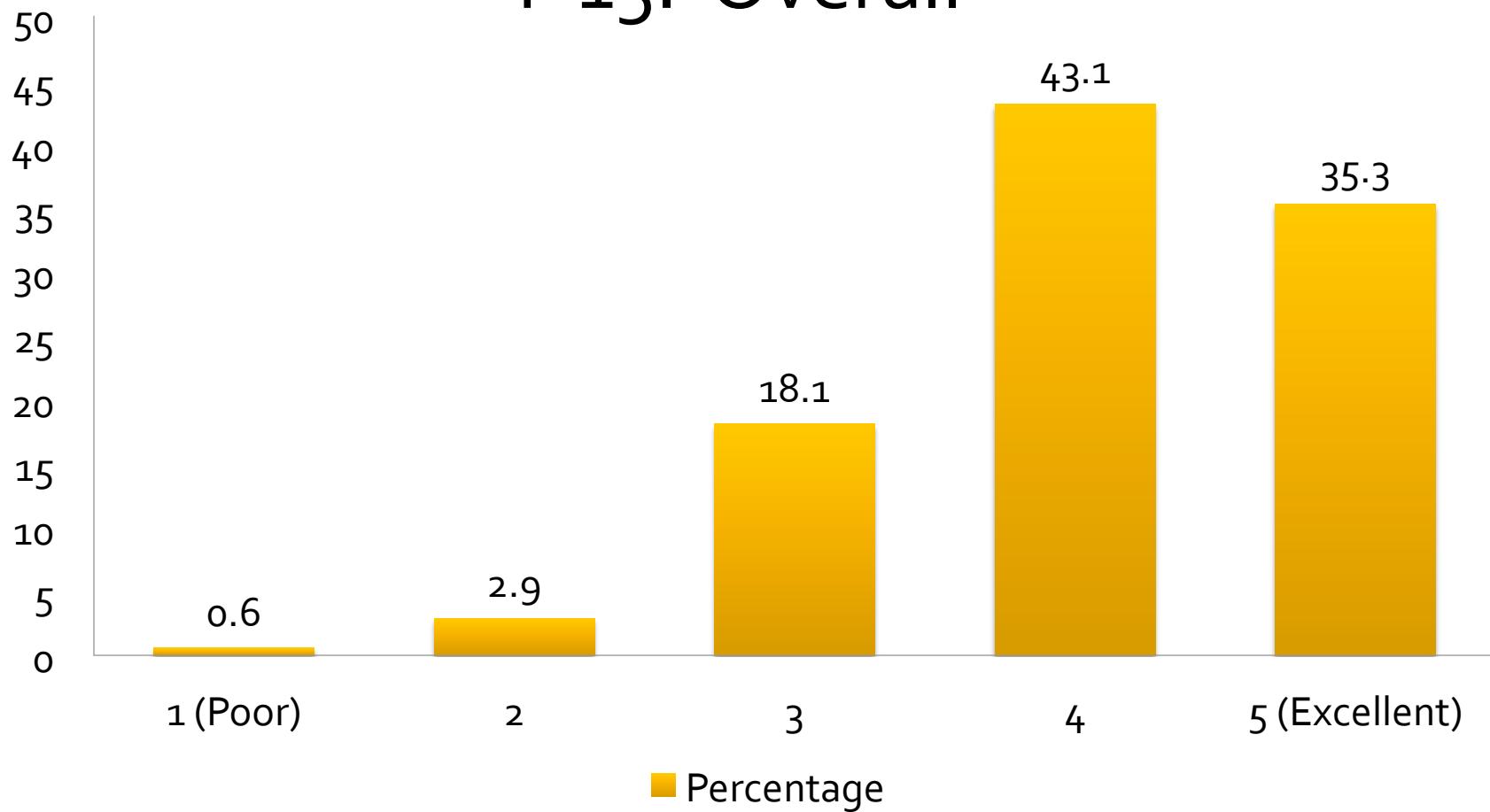
71%



EECS 183 F'15 students with no prior CS experience

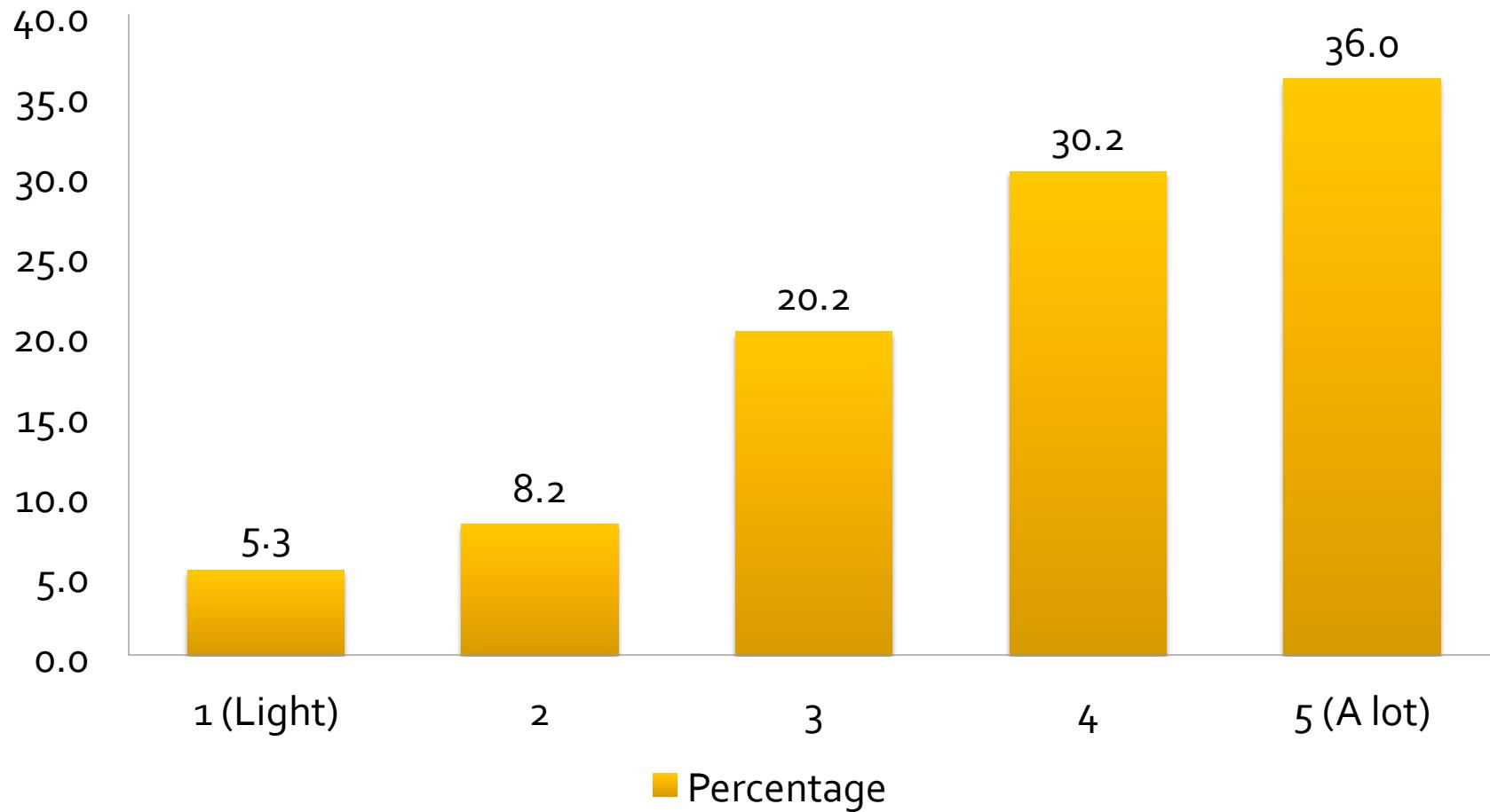
"You will learn SO much and do things you never imagined you'd be able to do."

F'15: Overall



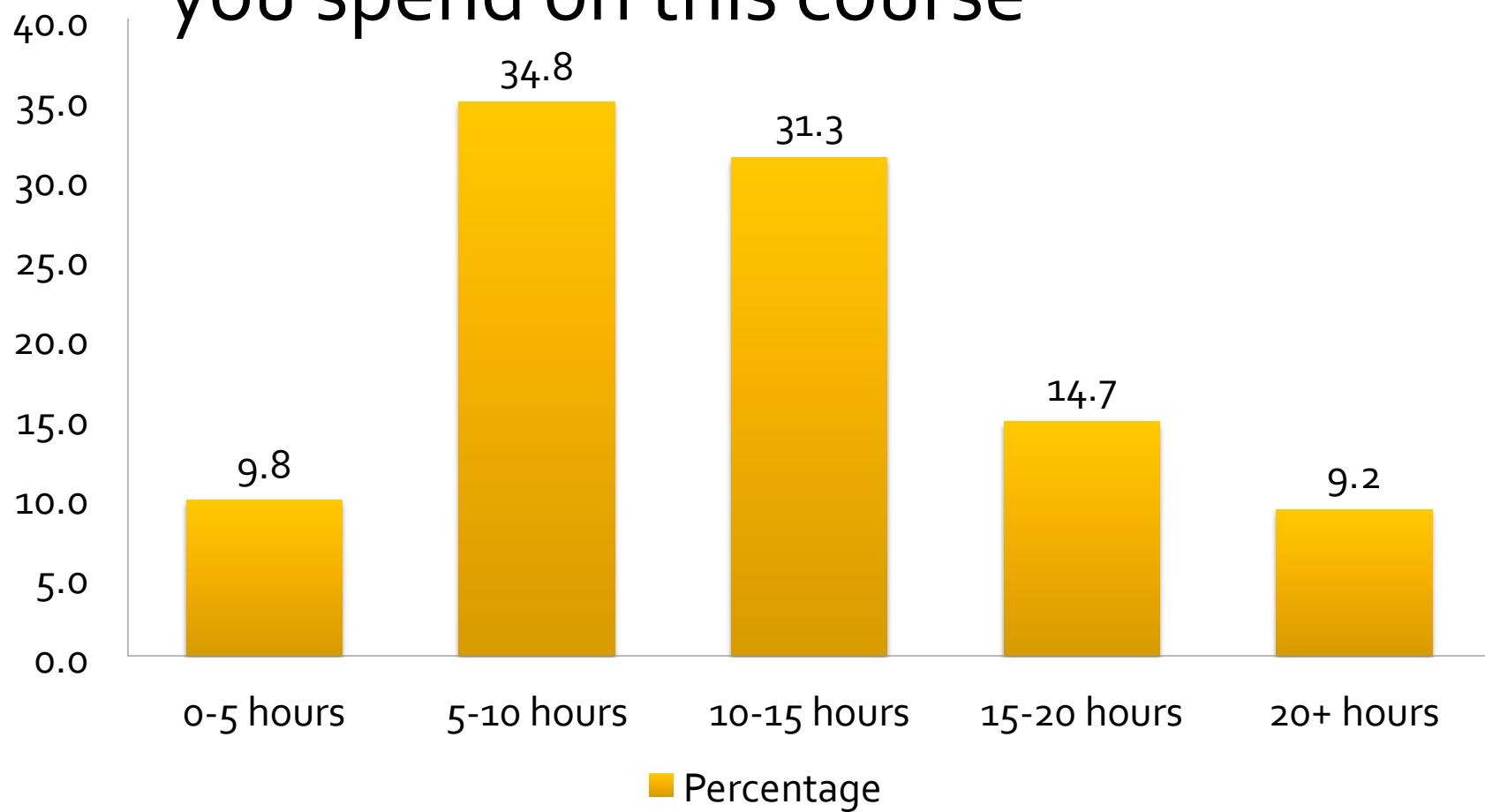
Demanding, but definitely doable

F'15 Work Load



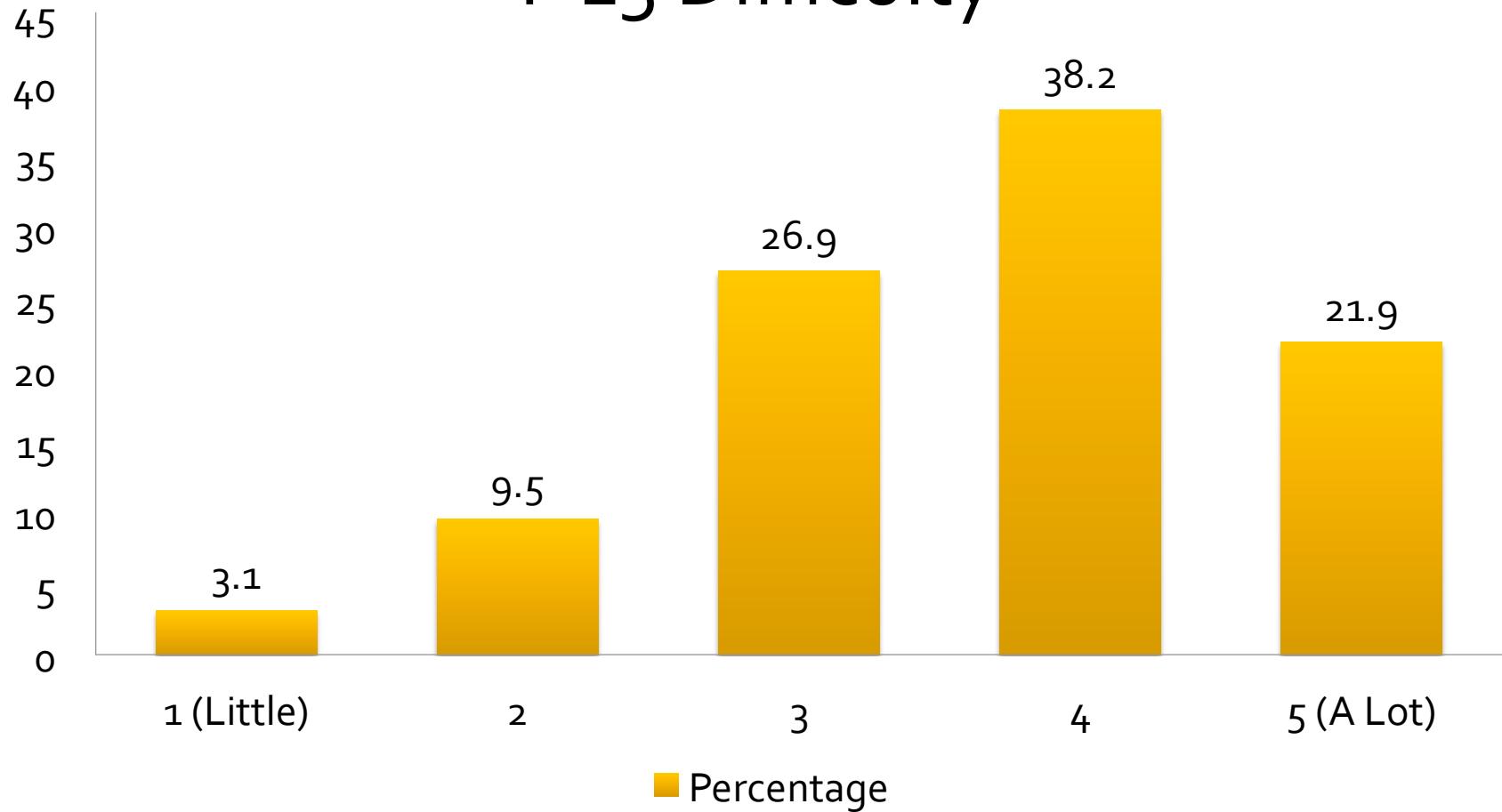
Demanding, but definitely doable

F'15 On average, how much time did you spend on this course



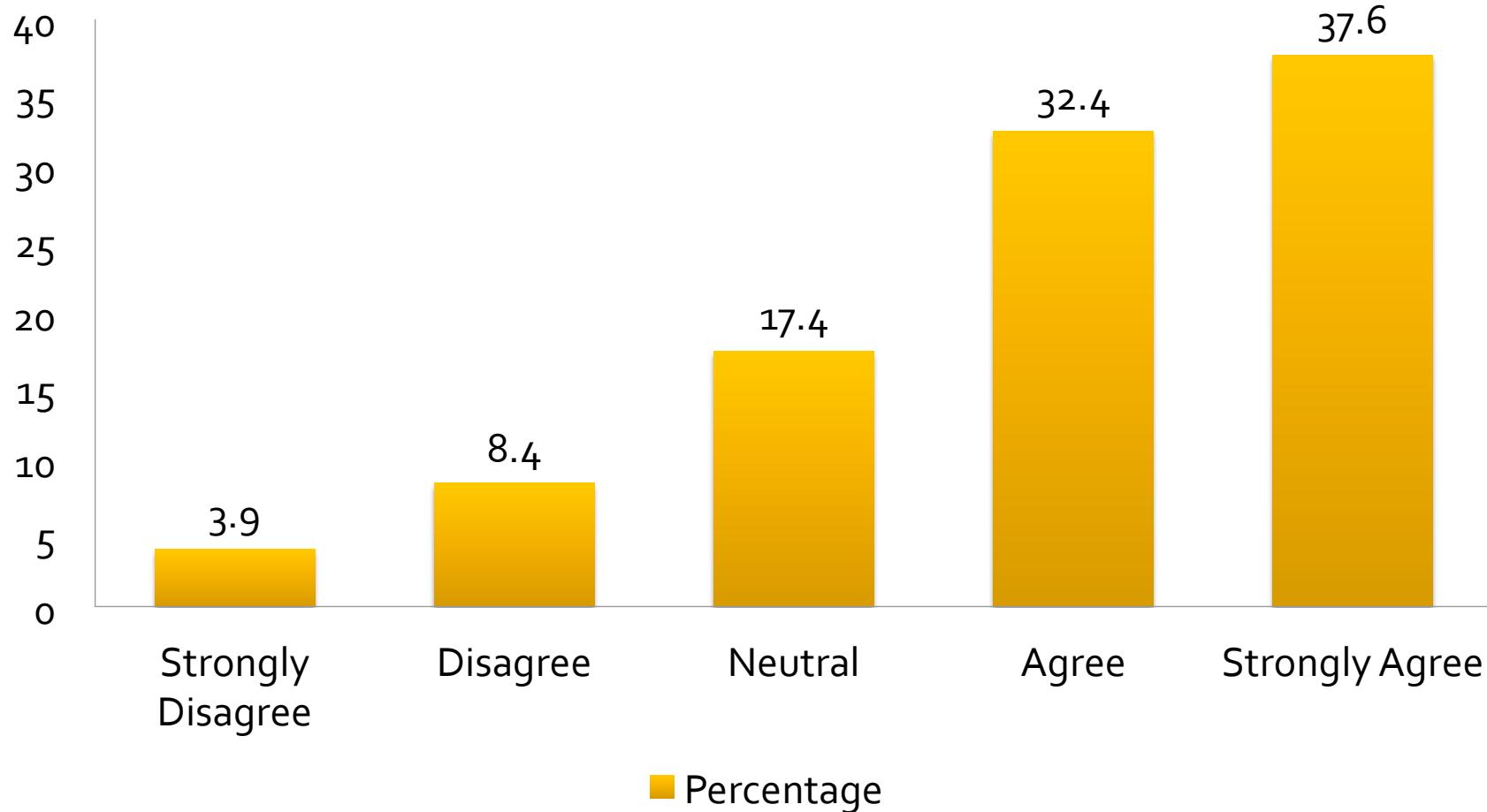
"I learned how to code, and that coding is something anyone can really do if they put in the effort?

F'15 Difficulty



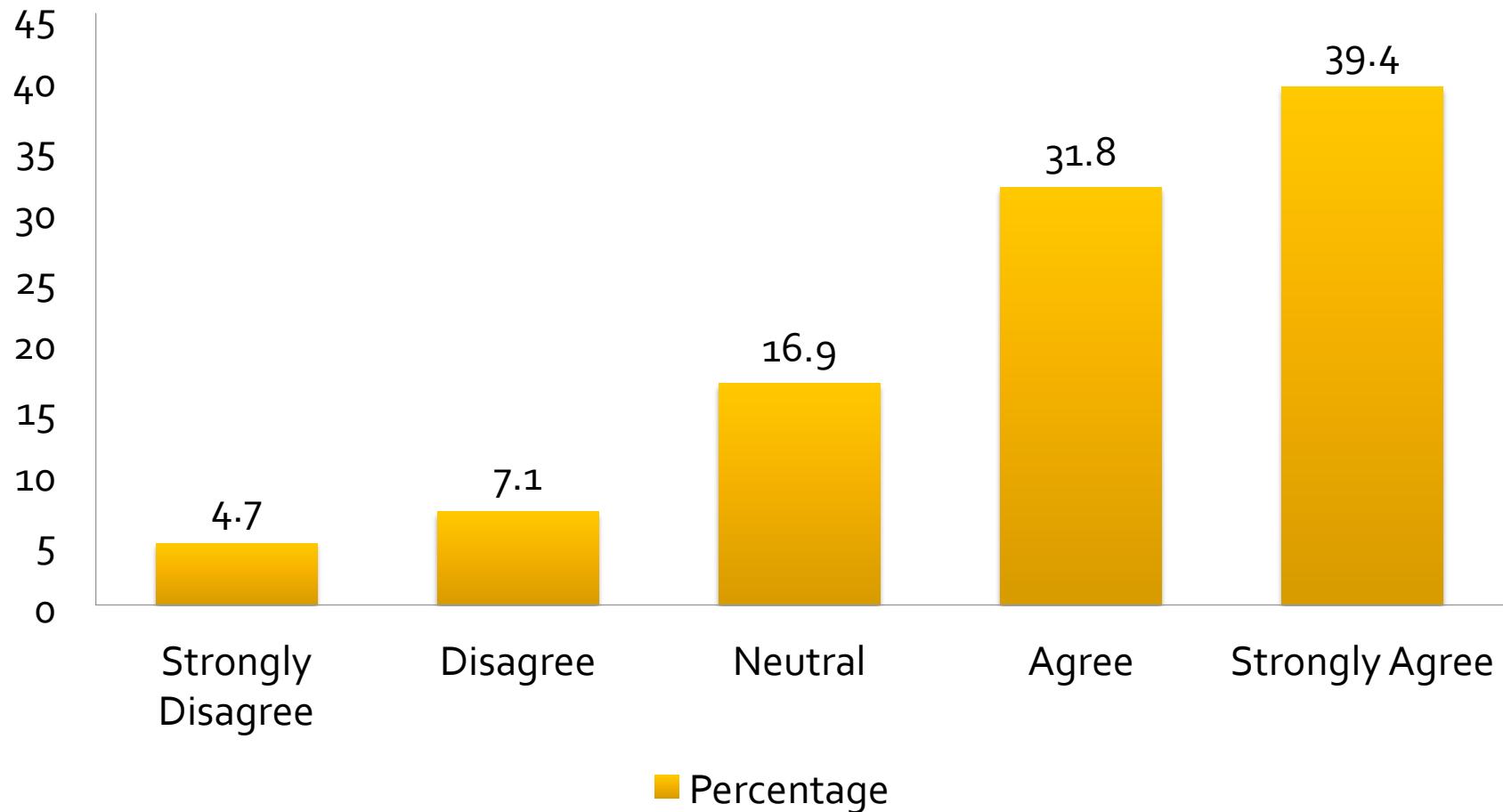
"183 was one of the most rewarding classes I've ever taken and it's definitely worth it to take the plunge."

F'15 "I enjoyed 183"



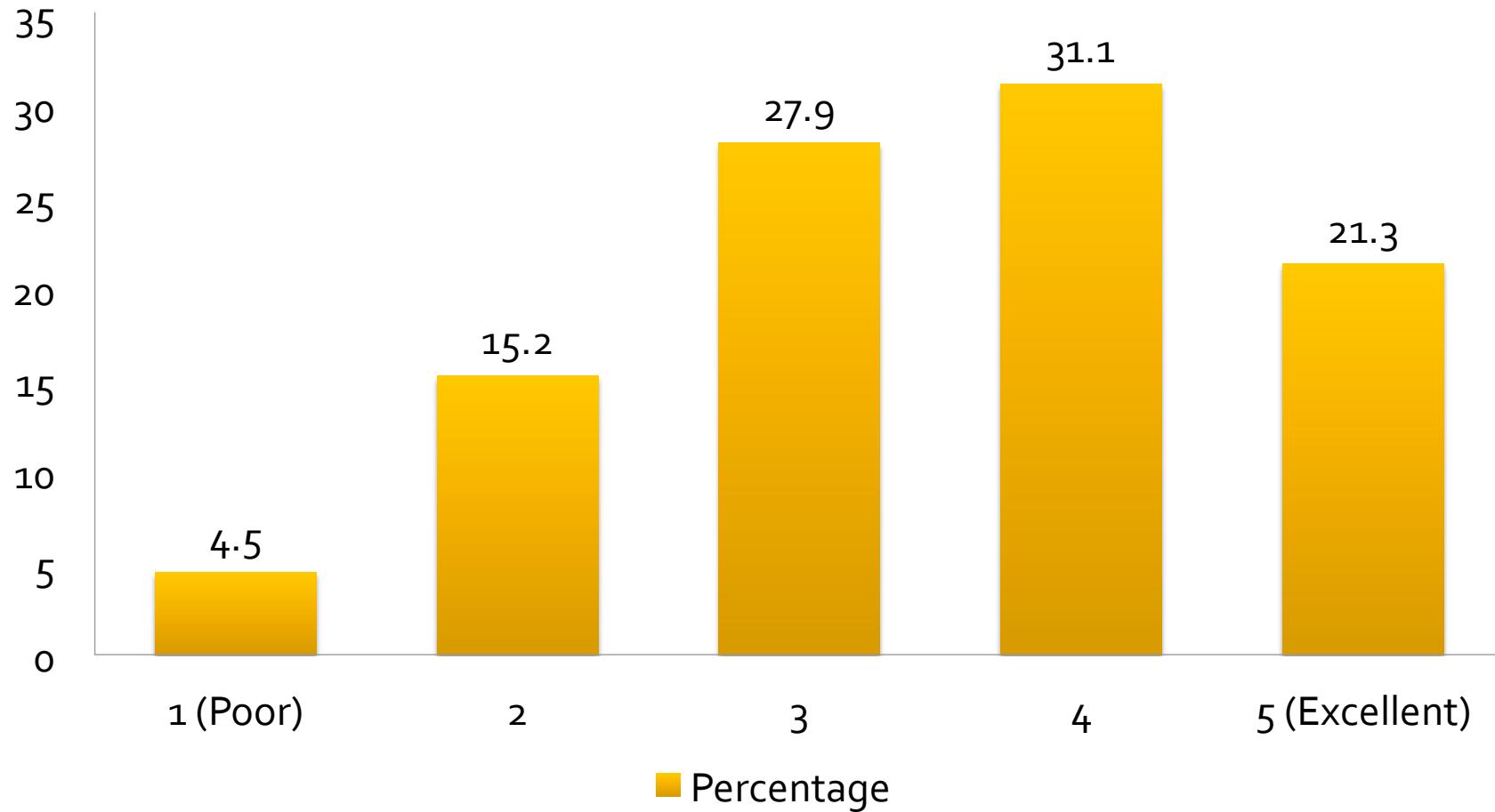
"I realized what it is like to truly be interested in a college course. Every time we learn something you can see how it is useful in life..."

F'15 "I would recommend this course ..."



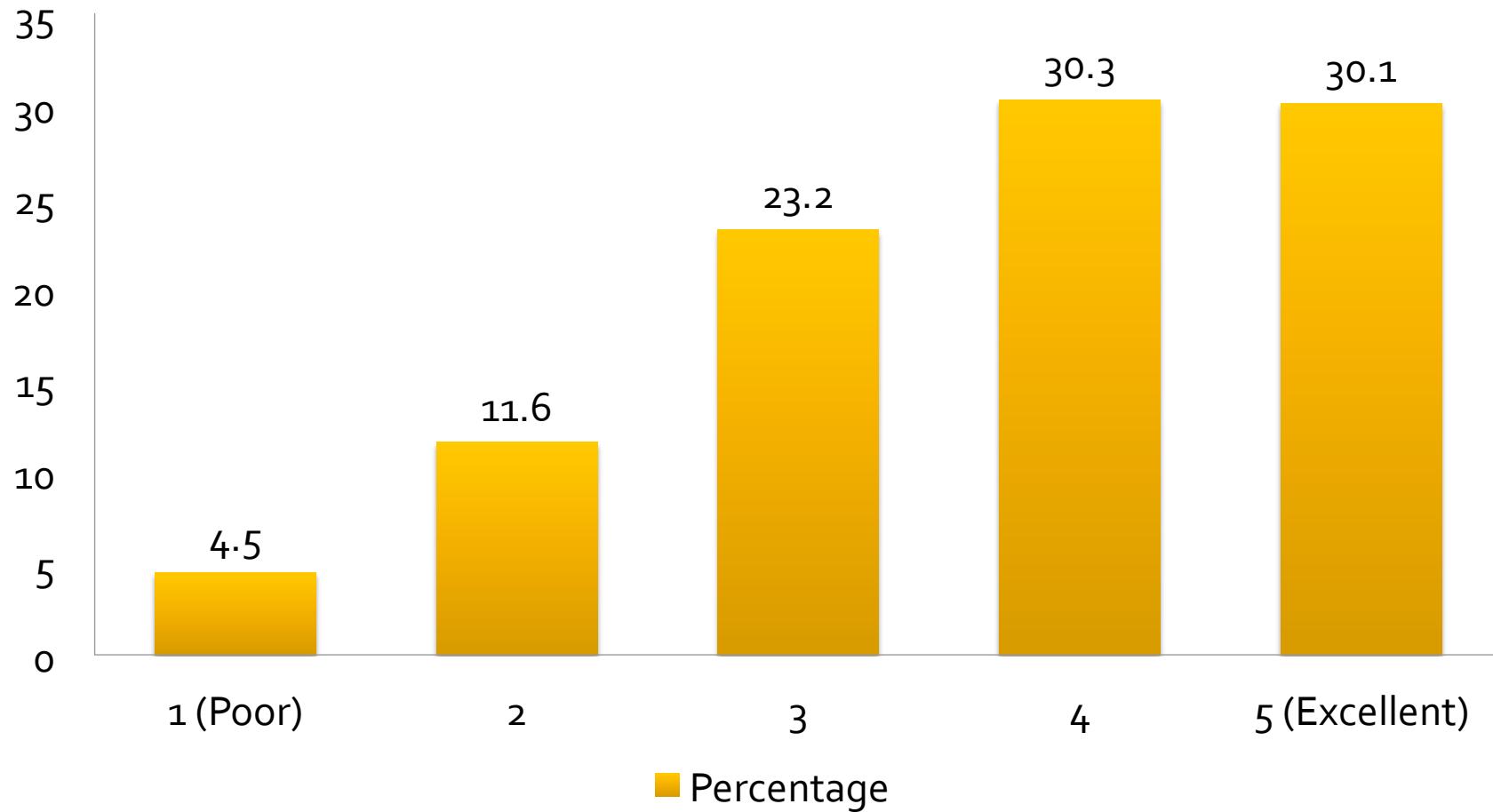
"A ton of work, but one of the few classes you come out of and can truly say, 'Wow, I learned a **** ton.' "

F'15 Rate the Lectures



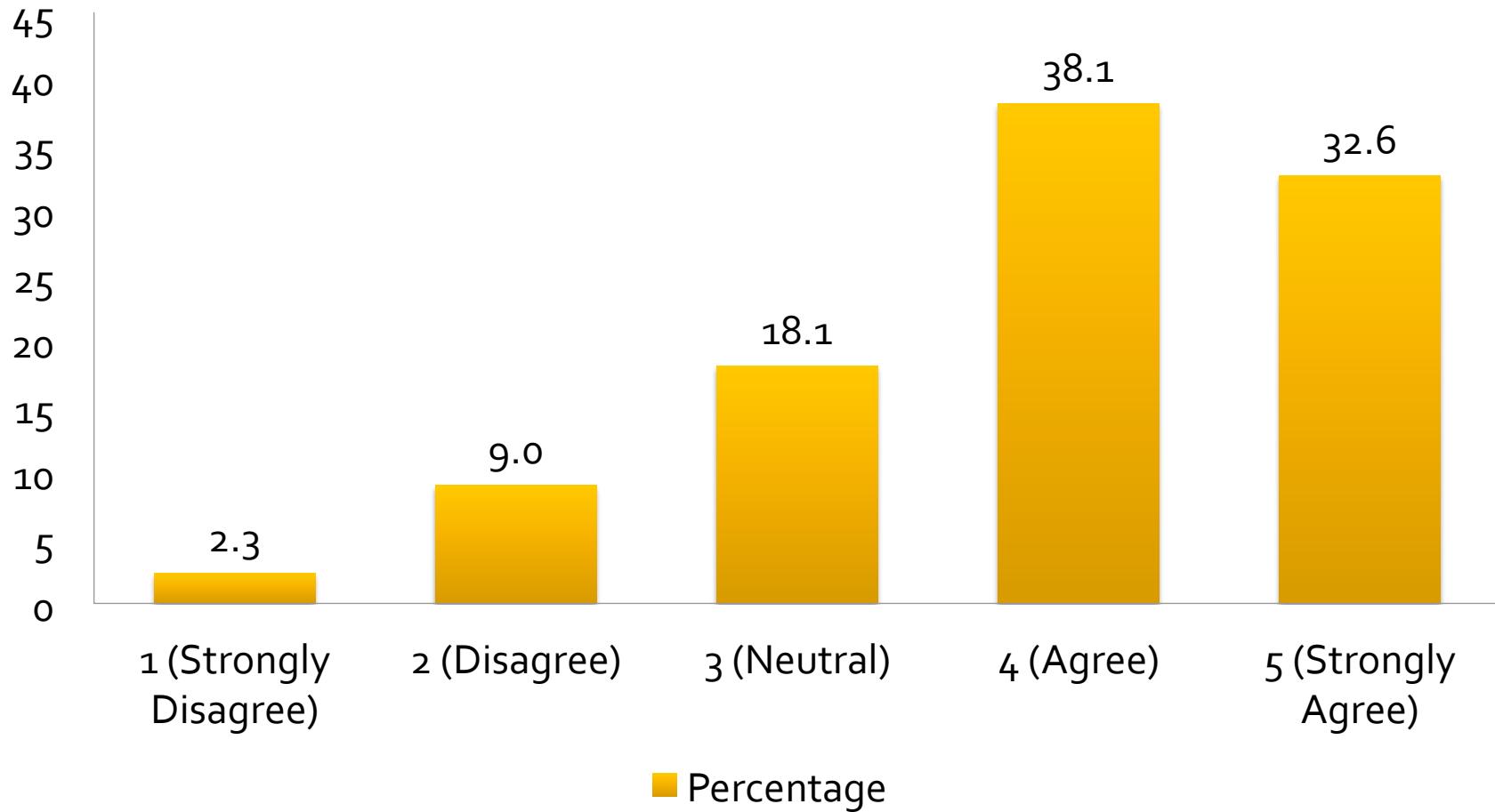
"There are 10 kinds of people in this world,
those who understand binary and those
who don't. "

F'15 Rate the Discussion Sections



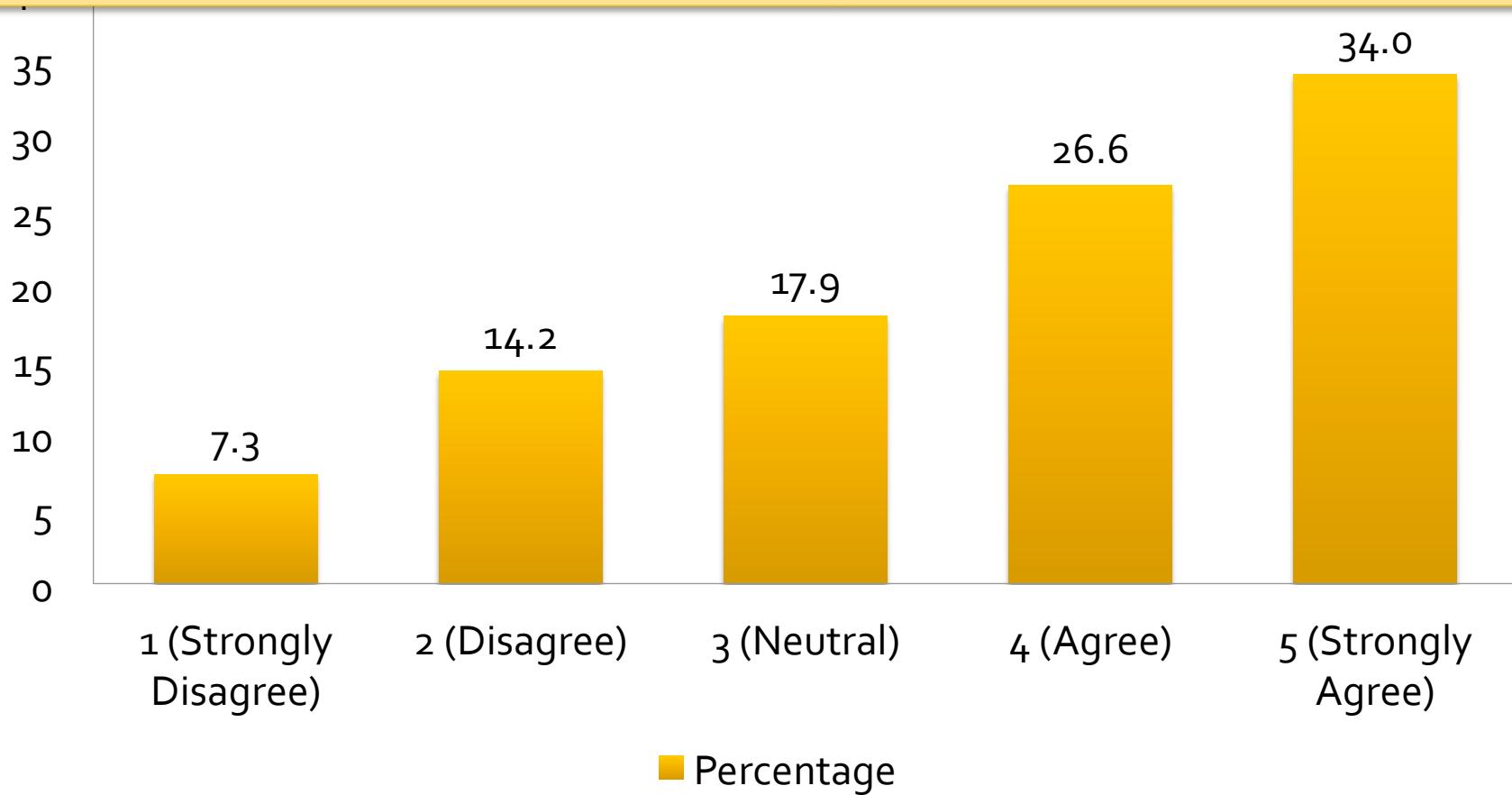
"Looking back it was an awesome course. In the beginning I hated it; I would get so frustrated with the programs, and I despised even thinking about C++. But as time went on, it all kind of clicked."

F'15 Staff is accessible and readily available to help

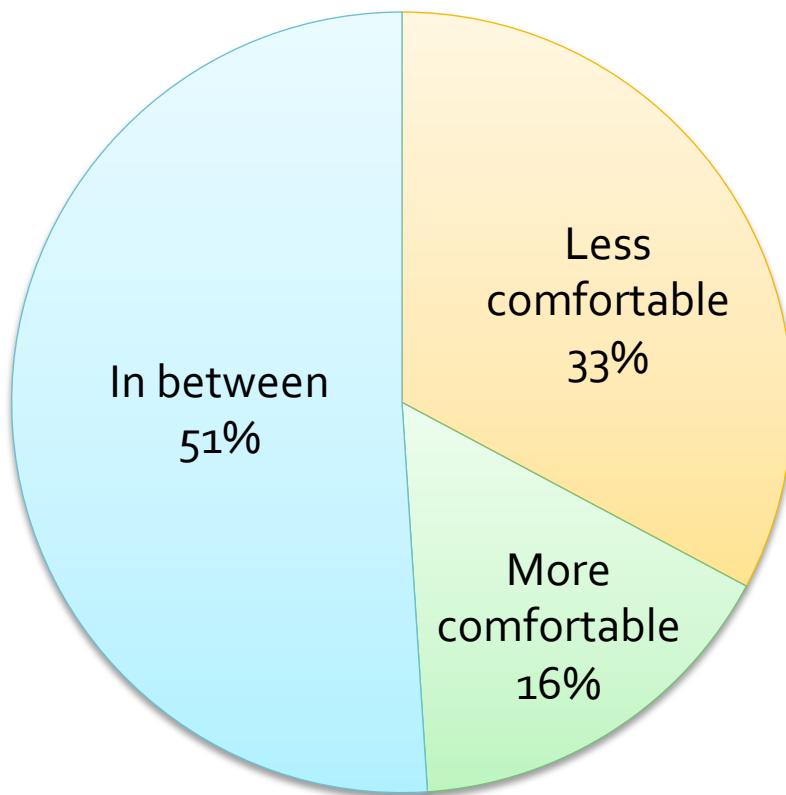


"CS taught me how to fail...What you don't realize is that every time you fail, you are one step closer to succeeding. The possibilities in CS are endless."

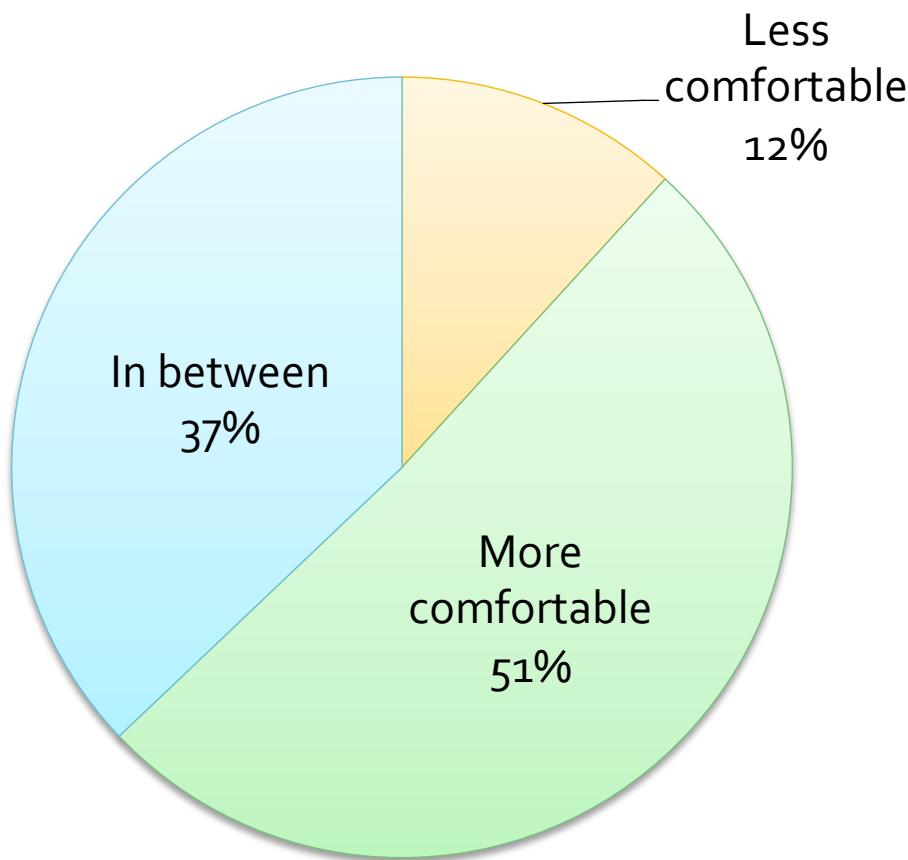
F'15 I am as comfortable in EECS 183 as I am in any of my other classes in other subject areas at U-M



Comfort Level: where they started



Comfort Level: where they ended



A Little Taste of C++ Code

Welcome to
EECS 183