LEC 18

CSE 122

Victory Lap & Next Steps

Questions during Class?

Raise hand or send here

sli.do #cse122

BEFORE WE START

Talk to your neighbors:

What was your favorite part about this quarter? Doesn't have to be about CSE 122 ☺

(Put AMA questions in sli.do!)

Music: [Hunter/Miya's Playlist]

Instructor	Hunter Schafer / Miya Natsuhara
TAs	Ajay, Andrew, Anson, Anthony, Audrey, Chloe, Colton, Connor, Elizabeth, Evelyn, Gaurav, Hilal, Hitesh, Jake, Jin, Joe, Joe, Karen, Kyler, Leon, Melissa, Noa, Parker, Poojitha, Samuel, Sara, Simon, Sravani, Tan, Vivek

You Made It!

MAGEDDON

m-istic a

YEAH-YOUGOTME

Lecture Outline

- Looking Back
- Looking Forward
  - Demo: Web Programming & Java
- Thank You!

CSE 121 (or CS1) vs. CSE 122

CSE 121 / AP CS / CS1 or Other Programming Experience

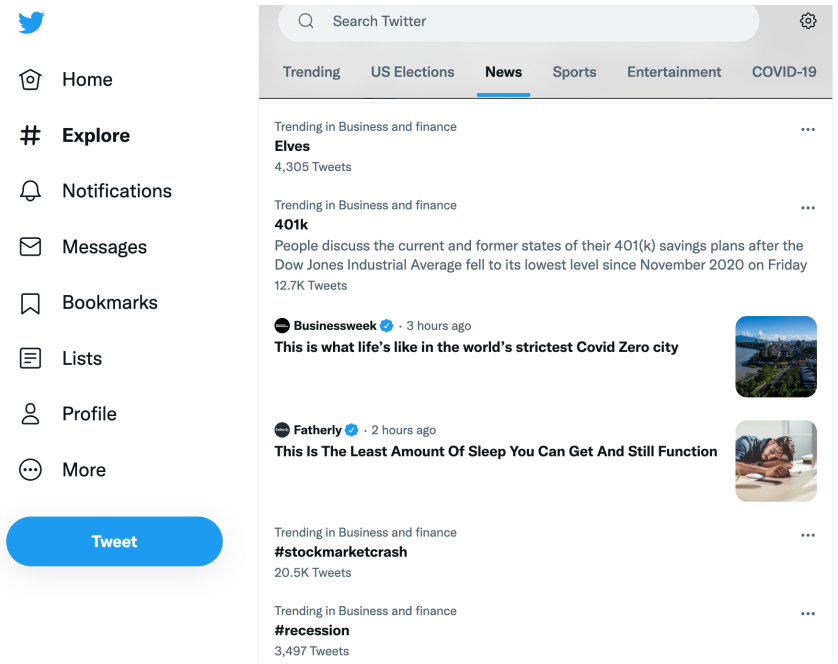
- Print statements
- Data types (int, String, boolean)
- Methods / Functions
  - Parameters
  - Returns
- Control structures
  - Loops
  - Conditionals
- File I/O
- Arrays
- **Computational Thinking** (language agnostic)

CSE 122 – Computer Programming II

- Decomposing large problems into smaller, manageable, subproblems
- Using data structures
  - List
  - Stacks / Queues
  - Sets
  - Maps
  - 2D Arrays
- Object Oriented Programming
  - Interfaces
  - Separation of Concerns

Why 122?

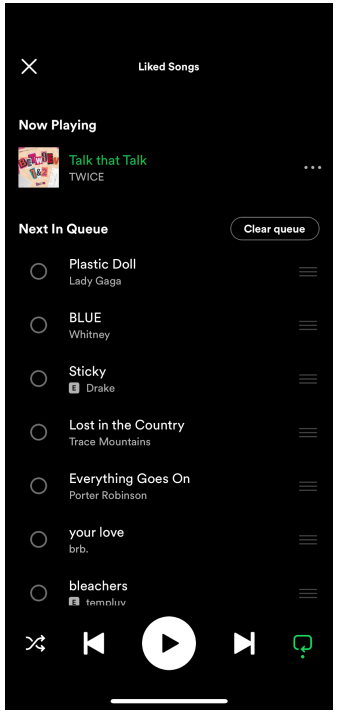
1. Build a strong foundation of data structures that will let you tackle the biggest problems in computing



Source: Twitter 9/23

122 Data Structures

Source: Ethical CS



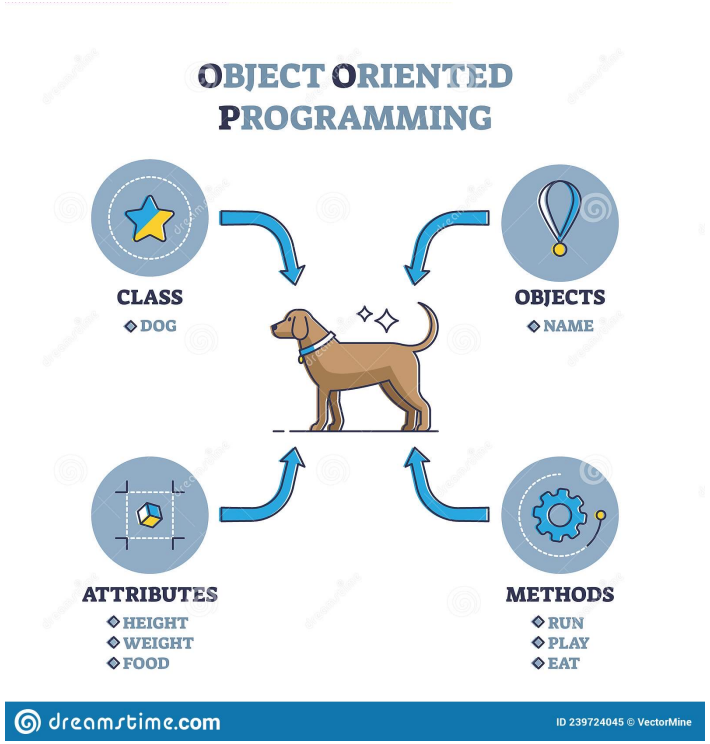
Source: Hunter's Spotify

Why 122?

2. Learn an important structural pattern for representing **objects** in code to make our code more **reusable** and **maintainable** and **easier to understand.**

- Java is designed around this idea of objects. We haven't been leveraging that yet!

- Used in almost every real-world software project.



Review So Far

CS Concepts

- Problem Solving
- Debugging
- Client/Implementer
- Object Oriented Programming
- Encapsulation
- Testing
- Third Party Libraries

Data Structures

- Lists
- Stacks
- Queues
- 2D Arrays
- Sets
- Maps

Java Language

- Intro to Java (e.g., File Processing)
- Iterators and For-each Loops
- Exceptions
- Interfaces
- References
- JUnit*

Java Collections

- Arrays / 2D Arrays
- ArrayList
- LinkedList
- Stack
- TreeSet / TreeMap
- HashSet / HashMap
- Interfaces for Java Collections

Lecture Outline

- Looking Back
- **Looking Forward**
  - Demo: Web Programming & Java
- Thank You!

What Can Come Next?

- Some ideas
  - Work on a project
  - Learn a new language
  - Learn a new library
  - Take more courses
  - Explore CS beyond programming
- The general idea though is… whatever you want!
  - You've learned an extremely powerful set of skills, use it on what you are most interested in pursuing!

What Project?

- Add a Graphical User Interface (GUI) to an assignment
- Automate your chemistry, physics, calculus problems, etc.
  - Maybe even automate writing code with good style?
- Organize and process data from your life (favorite quotes, your calendar, etc.)
- What are you currently doing that a computer could do?
- List of some project ideas (UW CSE alum)

What Language?

- Expanding your Java knowledge with a project is valuable. Or use a project to learn a new language!
- Pick a project, see what similar projects use! No wrong language to learn, certain tasks favor certain languages
  - iOS: Swift
  - Android: Java, Kotlin
  - Client-side web: Javascript (many frameworks to choose from)
  - Beautiful visuals: Processing
  - Data Processing + Machine Learning: Python
  - Data Management: SQL
  - Embedded systems: C / C++ / Rust
- Learn a new programming paradigm
  - Functional languages: Racket, Haskell, Scala, (now, Java 8!)

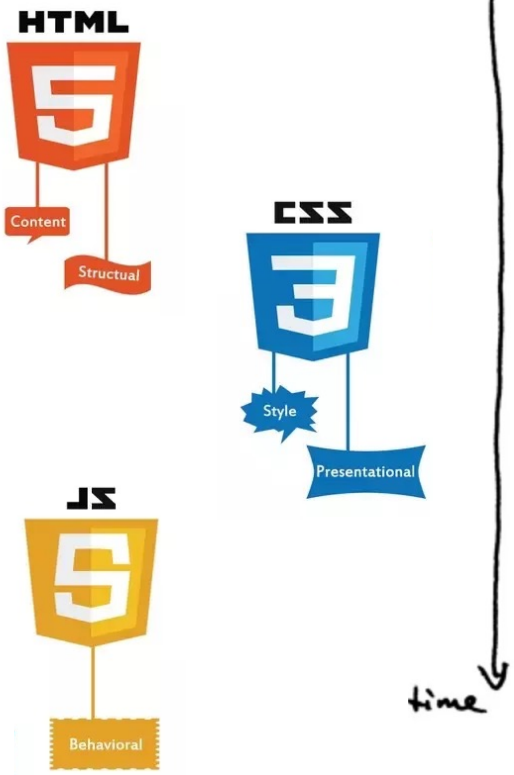
What Library?

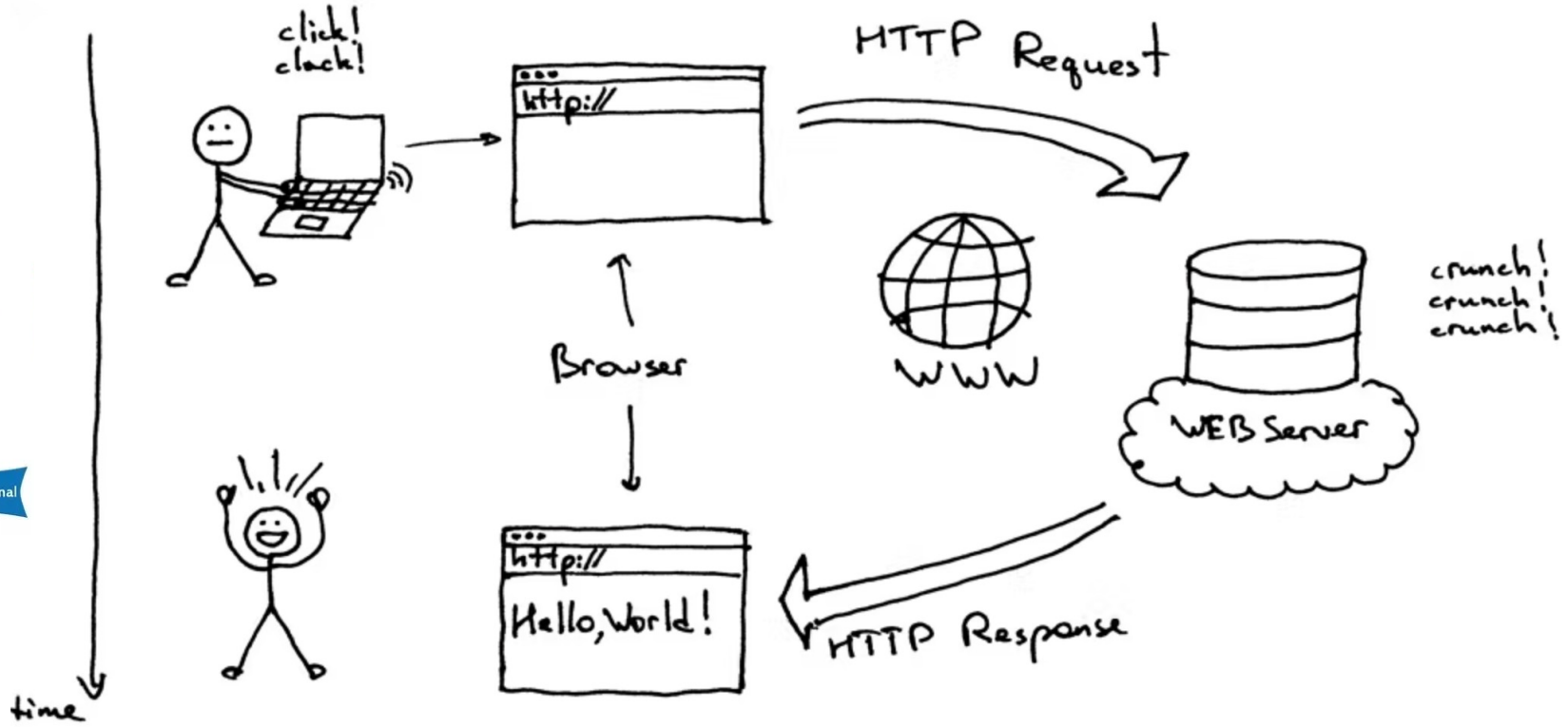
Here are just a FEW examples. There is so much more!

- Processing language
  - http://nlp.stanford.edu/software/
- Building games
  - http://lwjgl.org/
  - http://jbox2d.org/ (with physics!)
- Processing biological data
  - http://biojava.org/wiki/Main_Page
- Accessing Facebook data
  - http://restfb.com/
- Make a website backed by Java
  - https://www.jetbrains.com/help/idea/your-first-spring-application.html

Brief: How the Web Works

Usually All Of





Usually One Of

Source: [Shreya Ghate]

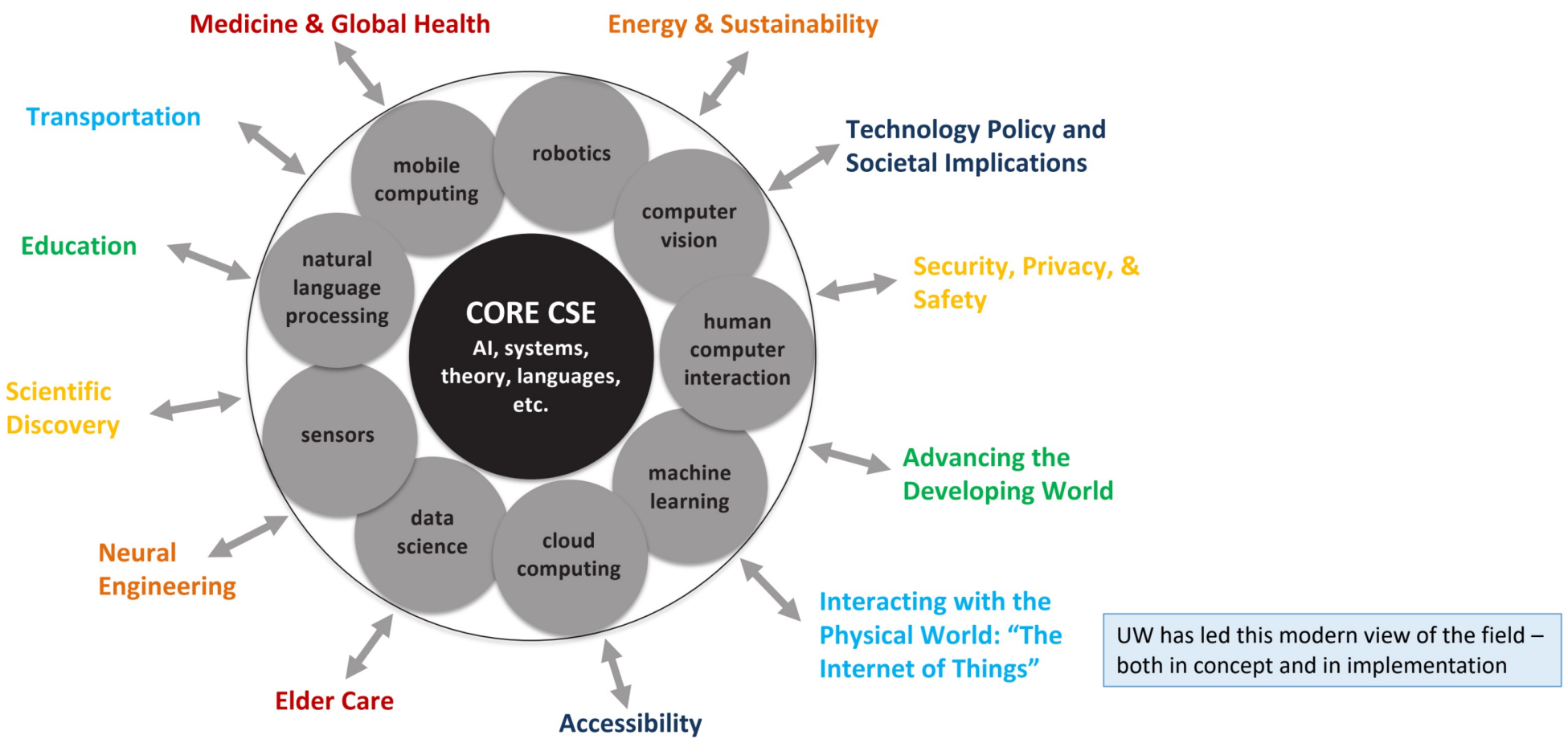
Source: [Knowledge Walls]

What Classes?

- CSE 123 is the most common next class. Continue the story, learn how data structures are implemented
- Other courses
  - CSE 154: Web Programming (HTML/CSS/Javascript)
  - CSE 163: Intermediate Data Programming (Python)
- ***Large*** set of CSE courses for *both* Allen School majors and students from all over UW campus. Many exciting courses, many (but not all) require CSE 123.
  - Allen School Majors
  - All UW Students
- Courses in Tech Related Majors: INFO, AMATH, HCDE, DXARTS, ...

What is CSE?

The changing nature of the field: From smaller/faster/cheaper to tackling societal challenges



UW has led this modern view of the field – both in concept and in implementation

Research Beyond Programming

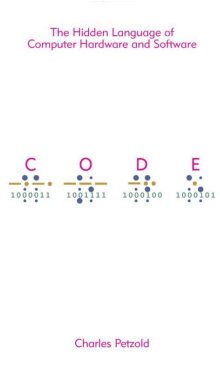
Learn a new CS Topic

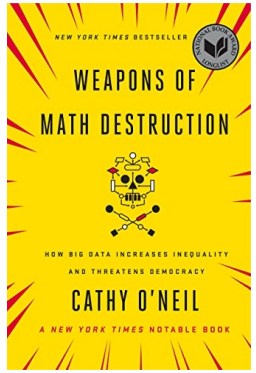
- Investigate how to best distribute relief funds
- Digitize basketball players
- Help deaf/hard-of-hearing people identify sounds
- Detect and prevent toxicity online
- Recognize disinformation online
- Make movies
- Improve digital collaboration
- Design algorithms that are more fair and better respect privacy
- Fix Olympic badminton
- And so much more!

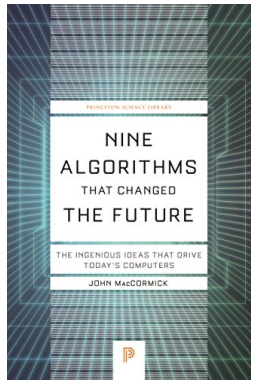
Attend Weekly Meetings

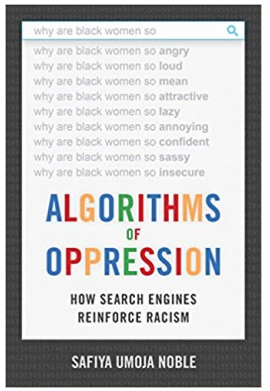
- Change – technologies for low-income regions
- Dub – human-computer interaction and design
- ComputingEd@UW – computer science education

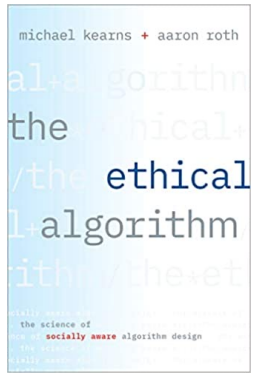
Read a Book! (links on pictures)

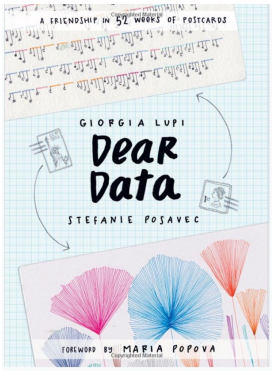












Lecture Outline

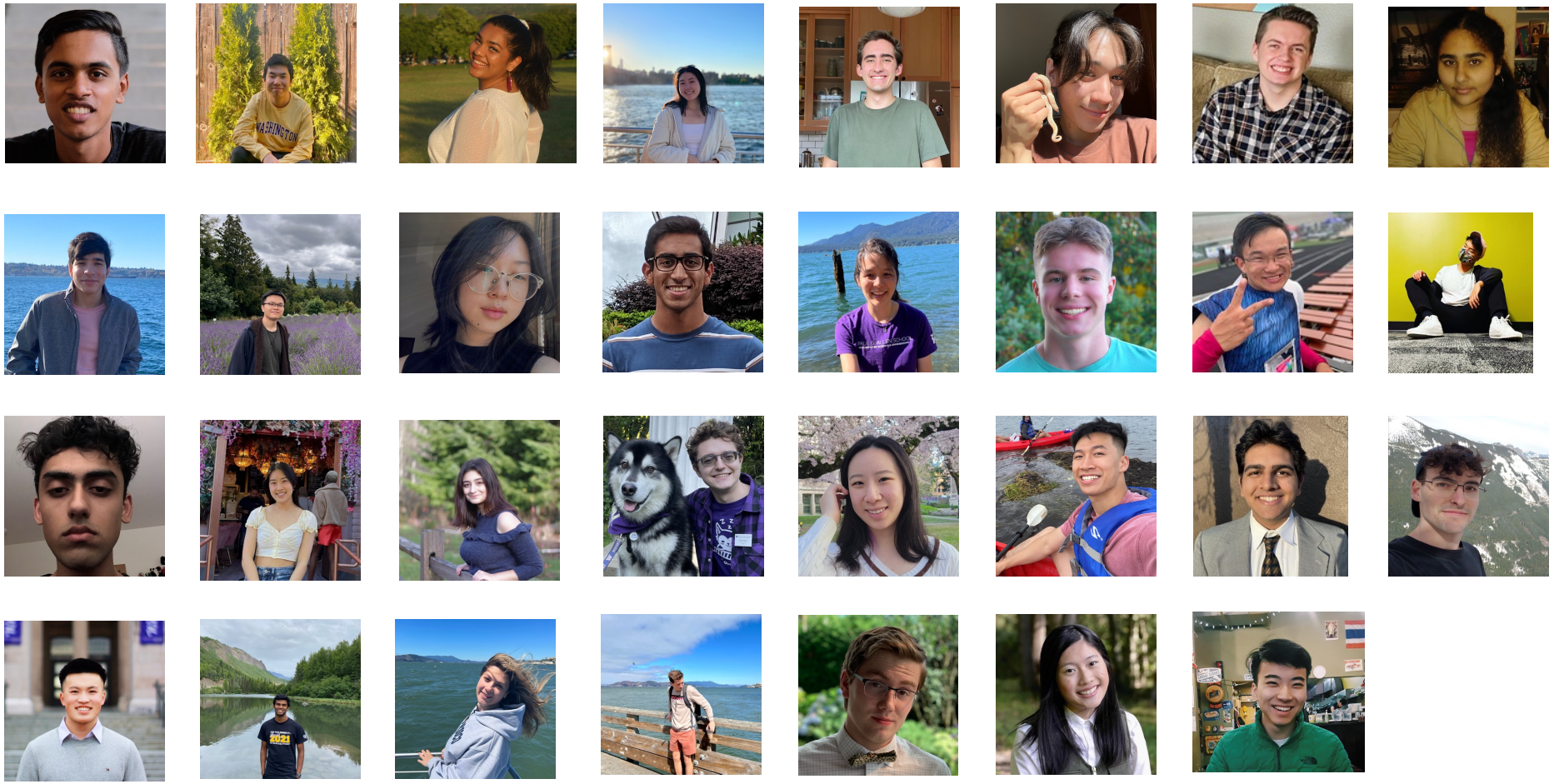
- Looking Back
- Looking Forward
  - Demo: Web Programming & Java
- **Thank You!**

Thank You! (Students)

- This is a brand-new course! We are always looking for feedback on how to improve the class for you and for future students! Thank you for your patience and understanding as we develop everything. ☺
  - We *really* value your feedback!
  - Let us know what's working and what isn't working for you
  - Something that went well in another course? Tell us about it!
- **Please fill out the Course Evaluation by Sunday 12/11 at 11:59 pm** to provide feedback about the course!

Thank You! (TAs)

Miya & Hunter and all of the students couldn't have done this quarter without all of your amazing TAs! Thanks to them for running the course!



Ask Us Anything

~~AMA~~ **AUA**