LEC 00

CSE 122

Welcome!

Questions during Class?

Raise hand or send here

sli.do #cse122

BEFORE WE START

Talk to your neighbors:
Introduce yourself to your neighbor!

What is your name? Major? What did you do over Winter break?

Music: Miya's 23wi CSE 122 Playlist

Instructor	**Miya Natsuhara**			
TAs	Ayush	Atharva	Ernie	Ambika
	Connor	Julia	Di	Elizabeth
	Poojitha	Megana	Logan	Joe
	Andrew A	Joey	Shivani	Jin
	Andrew C	Eesha	Michelle	Ben
	Jasmine	Lilian	Steven	Evelyn
	Darel	Thomas	Kevin	Kent
	Gabe	Leon	Ken	
	Karen	Melissa	Vivek	
	Colton	Audrey	Autumn	

Lecture Outline

- Introductions ◀
- About this Course
  - Course Components & Tools
  - Policies
  - Making the Most of this Class
- Intro/Review Java

Course Staff

- Instructor: Miya Natsuhara
- Teaching Assistants: 38 Awesome TAs
  - Available in section, office hours, and discussion board
  - Invaluable source of information & help in this course
- We’re excited to get to know you!
  - Our goal is to help you succeed ☺

Students

- Currently 737 students registered for the course!

- Strength in numbers
  - With 737 students, if you're confused about something, I guarantee someone else is too!
  - Students come from all different backgrounds & majors & interests in future career goals.

- Focus on us trying to help you build community
  - Meet others in the class to form study groups or have people you can work with.

What is this Class?

CSE 121 – Computer Programming I 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

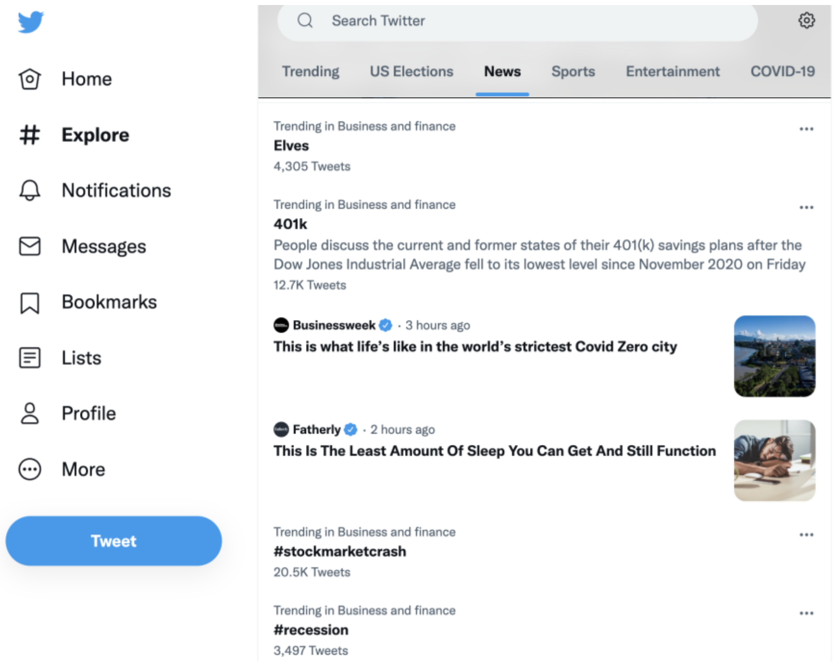
- Decomposing large problems into smaller, manageable, subproblems
- Using data structures
  - List
  - Stacks / Queues
  - Sets
  - Maps
- Object Oriented Programming
  - Interfaces

Prerequisite Knowledge

- Students entering CSE 122 are coming from many of different backgrounds
  - UW: CSE 121 or other intro programming course
  - Community College: Intro Programming Course
  - High School Programming Course (e.g., UWHS, AP CS, IB CS, etc.)
  - Self-taught or other previous experience
- Importantly: CSE 122 is in Java, but we **do not expect prior experience in Java!** Do expect knowing the list of CSE 121 topics in some language.
  - Students who do not have experience in Java will be focusing on practicing the programming skills you know in a new language!
  - You will find the Java Tutorial and Programming Assignment 0 very helpful!
- If you want to know if this class is the right fit for you, take the Allen School Self-Placement Test

Why 122?

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



Trending in Business and finance
Elves
4,305 Tweets

Trending in Business and finance
401k
People discuss the current and former states of their 401(k) savings plans after the Dow Jones Industrial Average fell to its lowest level since November 2020 on Friday
12.7K Tweets

Businessweek · 3 hours ago
This is what life's like in the world's strictest Covid Zero city

Fatherly · 2 hours ago
This Is The Least Amount Of Sleep You Can Get And Still Function

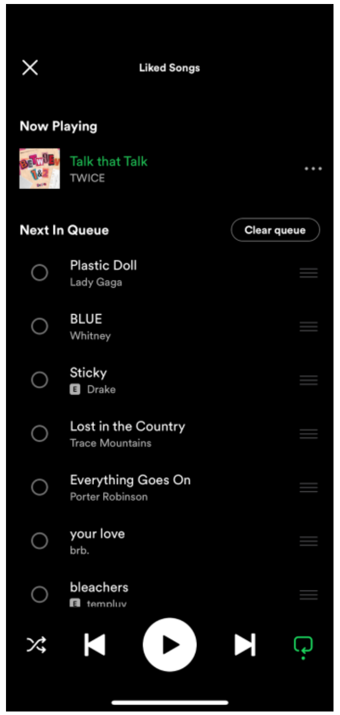
Trending in Business and finance
#stockmarketcrash
20.5K Tweets

Trending in Business and finance
#recession
3,497 Tweets

Source: Twitter 9/23

122 Data Structures

Source: Ethical CS



Talk that Talk
TWICE

Plastic Doll
Lady Gaga

BLUE
Whitney

Sticky
Drake

Lost in the Country
Trace Mountains

Everything Goes On
Porter Robinson

your love
brb.

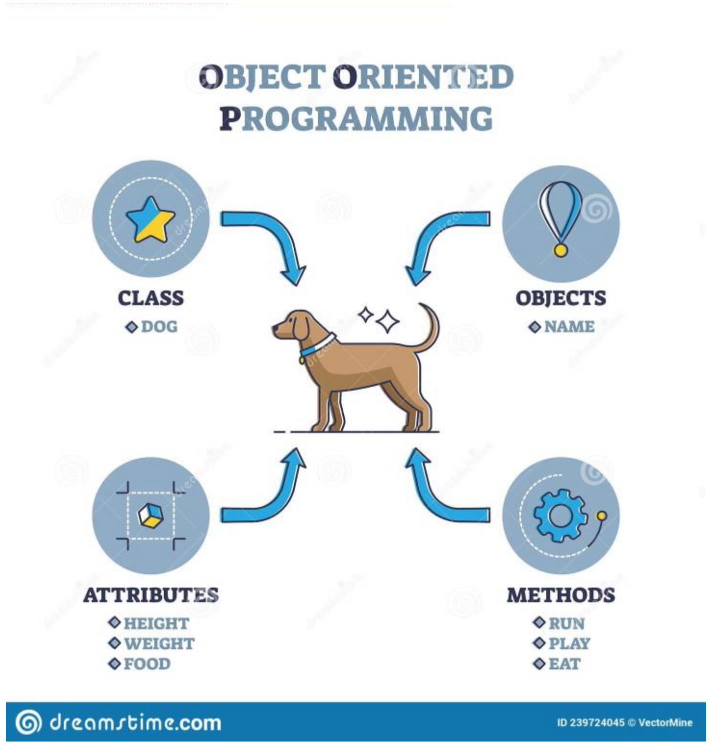
bleachers
templuv

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.



Lecture Outline

- Introductions
- **About this Course**
  - **Course Components & Tools**
  - Policies
  - Making the Most of this Class
- Intro/Review Java

Course Components

Meetings

LECTURES (x19)

- We're here!
- Introduce concepts, practice ideas, discuss applications.
- Pre-class materials to prepare for class each day. Due **before** class.

SECTIONS (x18)

- Held in person
- More practice, reviews, applications
- TA advice, how to be an effective student
- Preparation for quizzes / exams

Assessments

PROGRAMMING ASSIGNMENTS (x4)

- Structured assignments
- Programming in Java
- Applying & implementing course concepts

CREATIVE PROJECTS (x4)

- More open-ended assignments
- Explore new ideas and applications

QUIZZES (x3)

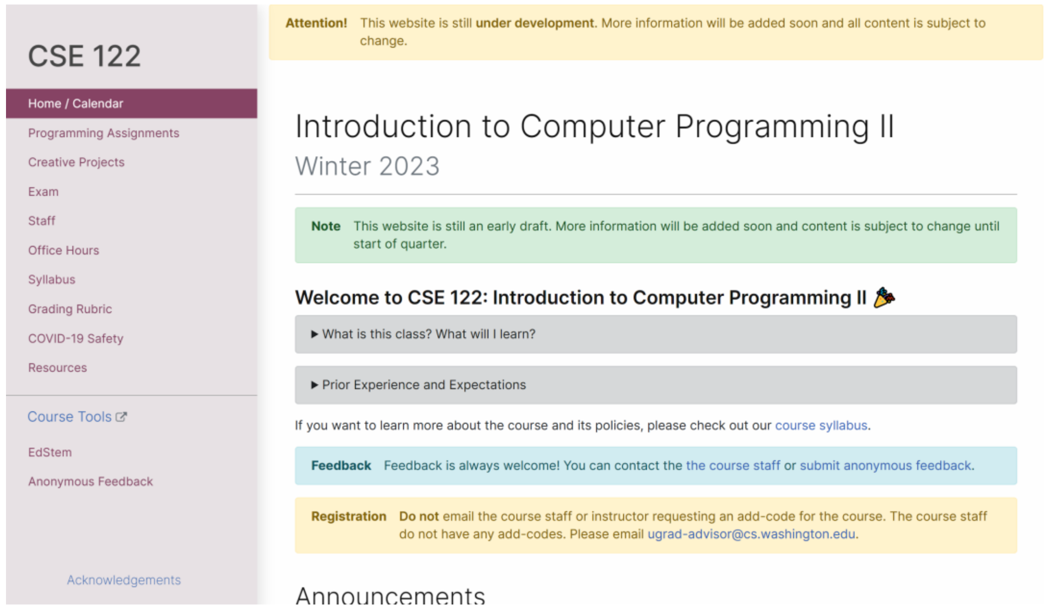
- Taken in quiz section
- 45 minutes on computer
- One retake per quiz

EXAM (x1)

- Culminating exam
- **Wednesday 3/15 @ 12:30 pm**

Course Website

cs.uw.edu/122



CSE 122

- Home / Calendar
- Programming Assignments
- Creative Projects
- Exam
- Staff
- Office Hours
- Syllabus
- Grading Rubric
- COVID-19 Safety
- Resources

Course Tools

- EdStem
- Anonymous Feedback

Acknowledgements

Attention! This website is still **under development**. More information will be added soon and all content is subject to change.

Introduction to Computer Programming II
Winter 2023

Note This website is still an early draft. More information will be added soon and content is subject to change until start of quarter.

Welcome to CSE 122: Introduction to Computer Programming II 🎉

▸ What is this class? What will I learn?

▸ Prior Experience and Expectations

If you want to learn more about the course and its policies, please check out our course syllabus.

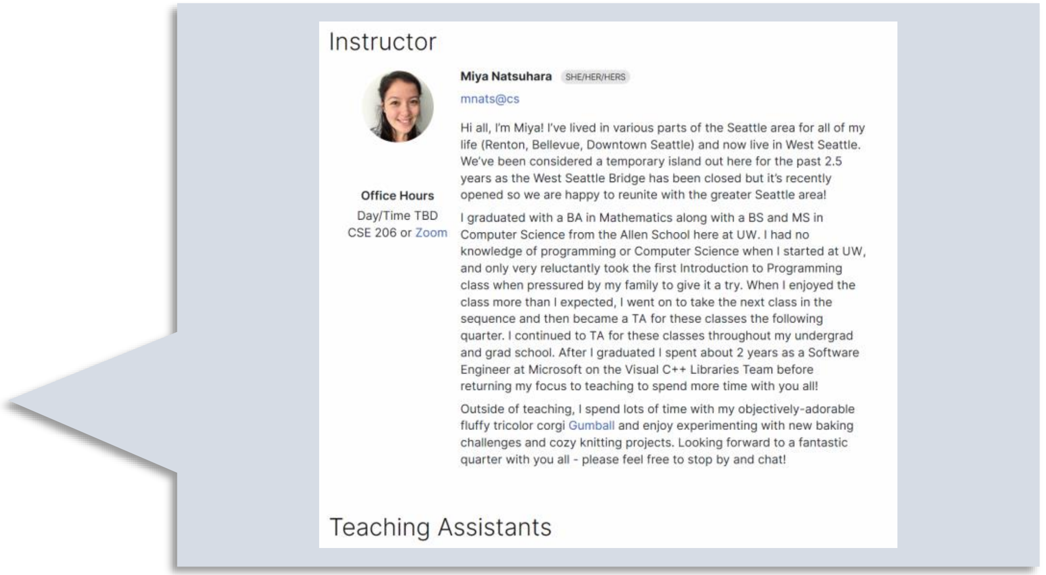
Feedback Feedback is always welcome! You can contact the the course staff or submit anonymous feedback.

Registration **Do not** email the course staff or instructor requesting an add-code for the course. The course staff do not have any add-codes. Please email ugrad-advisor@cs.washington.edu.

Announcements

Contains most course info – check frequently!

- Announcements, Calendar, Lecture Slides, Office Hours schedule, Staff Bios, Important Links



Instructor

Miya Natsuhara SHE/HER/HERS
mnats@cs

Office Hours
Day/Time TBD
CSE 206 or Zoom

Hi all, I'm Miya! I've lived in various parts of the Seattle area for all of my life (Renton, Bellevue, Downtown Seattle) and now live in West Seattle. We've been considered a temporary island out here for the past 2.5 years as the West Seattle Bridge has been closed but it's recently opened so we are happy to reunite with the greater Seattle area!

I graduated with a BA in Mathematics along with a BS and MS in Computer Science from the Allen School here at UW. I had no knowledge of programming or Computer Science when I started at UW, and only very reluctantly took the first Introduction to Programming class when pressured by my family to give it a try. When I enjoyed the class more than I expected, I went on to take the next class in the sequence and then became a TA for these classes the following quarter. I continued to TA for these classes throughout my undergrad and grad school. After I graduated I spent about 2 years as a Software Engineer at Microsoft on the Visual C++ Libraries Team before returning my focus to teaching to spend more time with you all!

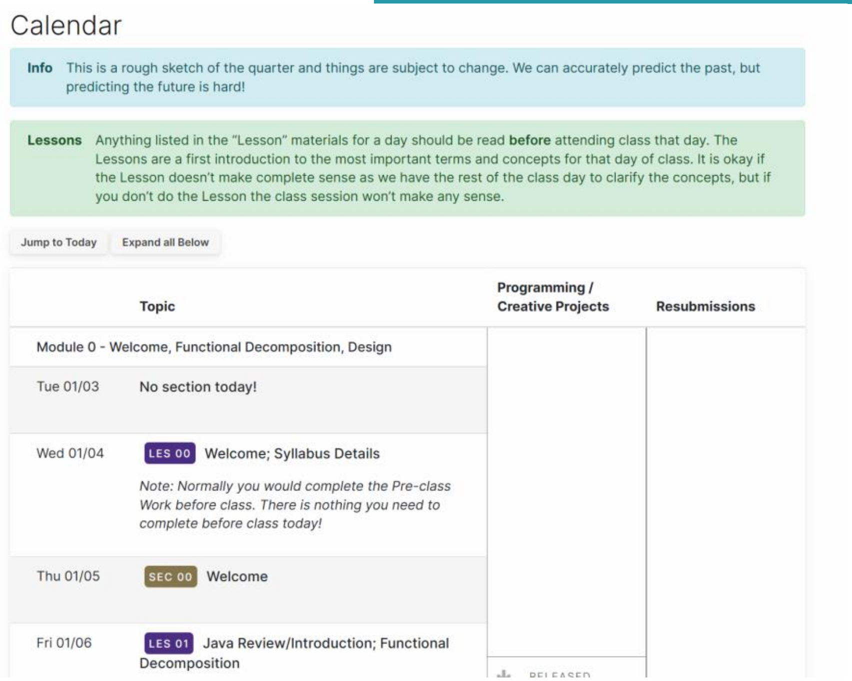
Outside of teaching, I spend lots of time with my objectively-adorable fluffy tricolor corgi Gumball and enjoy experimenting with new baking challenges and cozy knitting projects. Looking forward to a fantastic quarter with you all - please feel free to stop by and chat!

Teaching Assistants

Get to know the staff

Course Website

cs.uw.edu/122



Calendar

Info This is a rough sketch of the quarter and things are subject to change. We can accurately predict the past, but predicting the future is hard!

Lessons Anything listed in the "Lesson" materials for a day should be read **before** attending class that day. The Lessons are a first introduction to the most important terms and concepts for that day of class. It is okay if the Lesson doesn't make complete sense as we have the rest of the class day to clarify the concepts, but if you don't do the Lesson the class session won't make any sense.

Jump to Today | Expand all Below

	Topic	Programming / Creative Projects	Resubmissions
Module 0 - Welcome, Functional Decomposition, Design			
Tue 01/03	No section today!		
Wed 01/04	LES 00 Welcome; Syllabus Details *Note: Normally you would complete the Pre-class Work before class. There is nothing you need to complete before class today!*		
Thu 01/05	SEC 00 Welcome		
Fri 01/06	LES 01 Java Review/Introduction; Functional Decomposition		

Contains most course info – check frequently!

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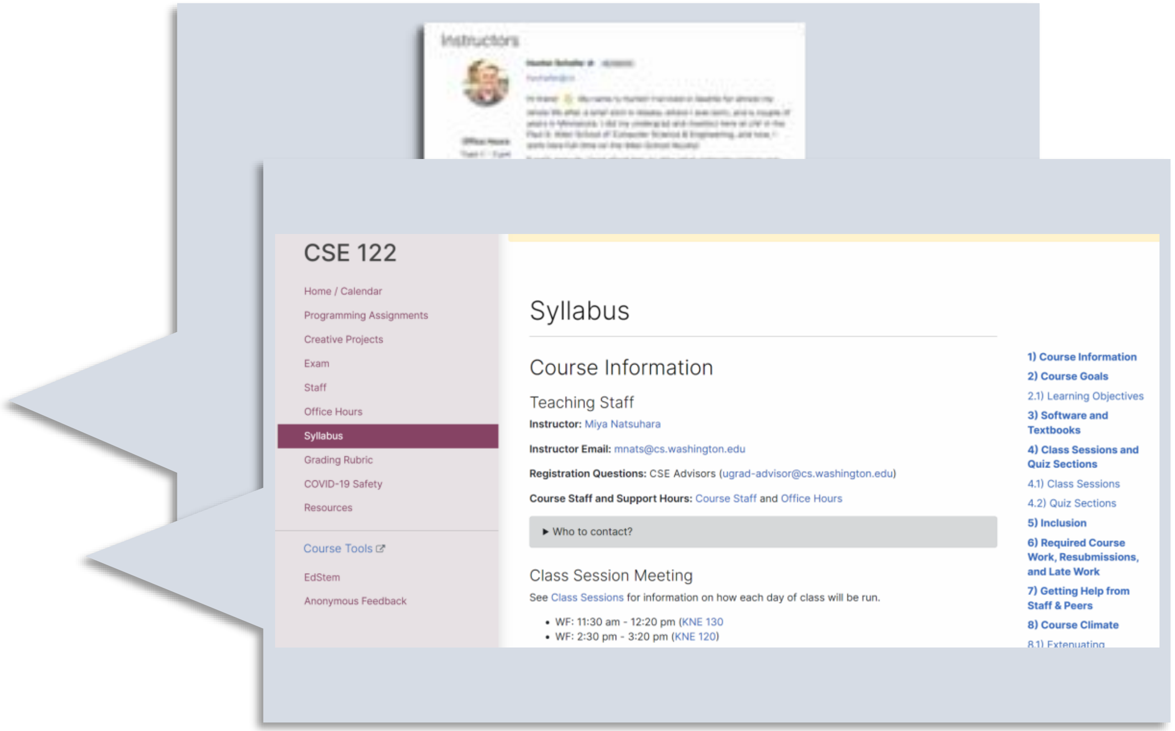


Instructors

CSE 122

Home / Calendar
Programming Assignments
Creative Projects
Exam
Staff
Office Hours
Syllabus
Grading Rubric
COVID-19 Safety
Resources

Course Tools
EdStem
Anonymous Feedback

Syllabus

Course Information

Teaching Staff

Instructor: Miya Natsuhara

Instructor Email: mnats@cs.washington.edu

Registration Questions: CSE Advisors (ugrad-advisor@cs.washington.edu)

Course Staff and Support Hours: Course Staff and Office Hours

▸ Who to contact?

Class Session Meeting

See Class Sessions for information on how each day of class will be run.

- WF: 11:30 am - 12:20 pm (KNE 130
- WF: 2:30 pm - 3:20 pm (KNE 120)

1) Course Information
2) Course Goals
2.1) Learning Objectives
3) Software and Textbooks
4) Class Sessions and Quiz Sections
4.1) Class Sessions
4.2) Quiz Sections
5) Inclusion
6) Required Course Work, Resubmissions, and Late Work
7) Getting Help from Staff & Peers
8) Course Climate
8.1) Extenuating

Please familiarize yourself with the course syllabus this week!

Other Course Tools

Ed
- Community & Information
  - Discussion Board
    (please ask & answer!; anonymous option)
  - Chat
  - Announcements
- Pre-Class Materials / Section Handouts
- Assignments
  - Online IDE
  - Submit assignments
  - View Feedback

My Digital Hand

My Digital Hand
- Queueing in office hours

IntelliJ
- Develop offline
- Visual debugger

Canvas
- Gradebook
- Lecture recordings

Sli.do
- In-class activities
  (ungraded)
- No account needed

Lecture Outline

- Introductions
- **About this Course**
  - Course Components & Tools
  - **Policies**
  - Making the Most of this Class
- Intro/Review Java

Resubmissions / Retakes

Learning is a challenging process that takes time, it doesn't always happen on your first try.

- Each week, one previous Programming Assignment or Creative Project can be resubmitted
  - Must be accompanied by write up explaining changes
  - Grade on resubmission replaces original grade.
- To stay caught-up with the course, each assignment can only be resubmitted at most once over the quarter.
  - If you find an unforeseen circumstance that requires you to use more than one resub for a particular assignment, you need to discuss with your TA a plan to stay caught-up in order before we can accommodate extra resubs.
- Each quiz can be retaken at most once

See syllabus for more details

Collaboration

- These concepts are challenging: we strongly encourage discussion + collaboration!
    - Don’t attempt to gain credit for something you didn’t do
    - In general, share ideas and work together, but don’t copy work. Never show someone else your code or solution write up.
    - For any ungraded work (e.g., pre-class materials) there is no concern about academic misconduct! You should be collaborating on those without reservation.
    - On graded assignments you should still collaborate, but the code you write should be of your own creation.
    - Always cite the help you receive on graded work
- Withdrawal Policy
- **Read full policy in Syllabus**

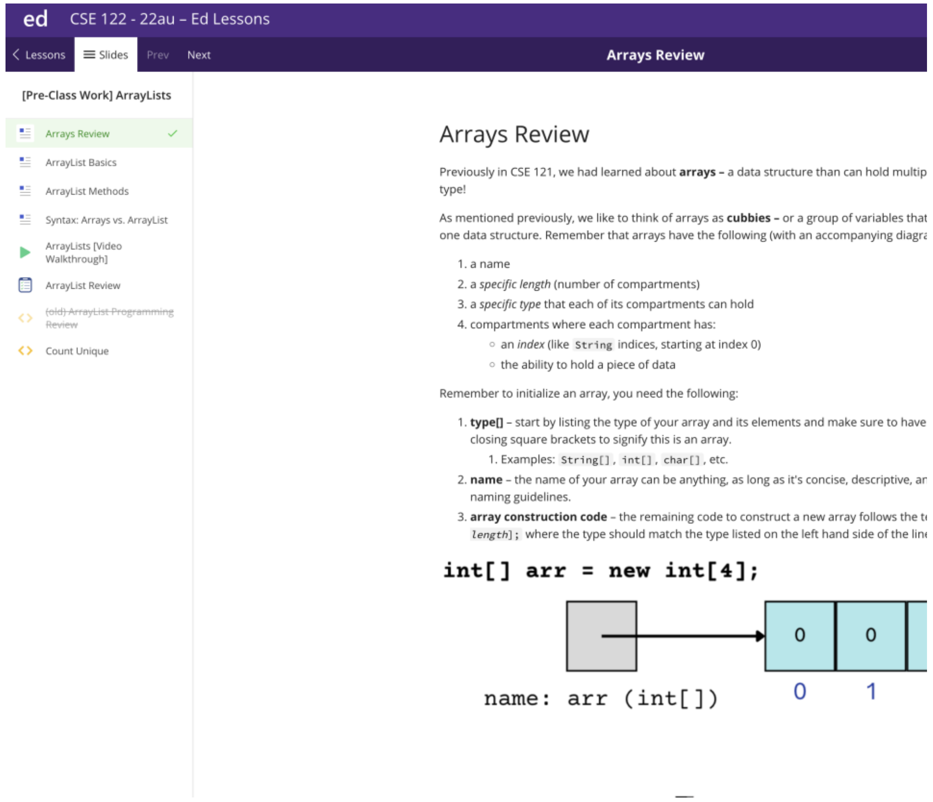
Textbook

Pre-class Materials

- All required readings are available free on Ed!
- Should be finished before class (not graded)

Optional Textbook

- [Building Java Programs by Reges and Stepp (5th Edition)]
- Not required but does add another perspective. Will reference relevant chapters.
- Advice: only purchase if you learn best with a textbook, otherwise not recommended.


ed
CSE 122 - 22au – Ed Lessons
Lessons
Slides
Prev
Next
Arrays Review
[Pre-Class Work] ArrayLists
Arrays Review ✓
ArrayList Basics
ArrayList Methods
Syntax: Arrays vs. ArrayList
ArrayLists [Video Walkthrough]
ArrayList Review
~~(old) ArrayList Programming Review~~
Count Unique

Arrays Review

Previously in CSE 121, we had learned about **arrays –** a data structure than can hold multip
type!

As mentioned previously, we like to think of arrays as **cubbies –** or a group of variables that
one data structure. Remember that arrays have the following (with an accompanying diagra

1. a name
2. a *specific length* (number of compartments)
3. a *specific type* that each of its compartments can hold
4. compartments where each compartment has:
   - an *index* (like `String` indices, starting at index 0)
   - the ability to hold a piece of data

Remember to initialize an array, you need the following:

1. **type[]** – start by listing the type of your array and its elements and make sure to have
   closing square brackets to signify this is an array.
   1. Examples: `String[]`, `int[]`, `char[]`, etc.
2. **name** – the name of your array can be anything, as long as it's concise, descriptive, ar
   naming guidelines.
3. **array construction code** – the remaining code to construct a new array follows the t
   `length];` where the type should match the type listed on the left hand side of the line

```
int[] arr = new int[4];
```

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  - **Making the Most of this Class**
- Intro/Review Java

How Learning Works

- Learning requires **active participation** in the process. It’s not as simple as sitting and listening to someone talk at you.
  - Requires **deliberate practice** in **learning by doing**
  - Benefits from **collaborative learning**
- Hybrid classroom model
  - Asks you to do some preparation before class in the form of readings and practice problems.
    - Should take ~30 minutes a day
  - Class will start with brief recap, then pick up where the reading and practice problems leave off.
  - Attendance isn’t graded, but showing up and trying is the first step in succeeding in the class!
- Pre-class materials are ungraded, but
  - It’s okay if you find them challenging! That means you are learning!

Metacognition

- **Metacognition**: asking questions about your solution process.

- Examples:
  - **While debugging**: explain to yourself why you're making this change to your program.
  - **Before running your program**: make an explicit prediction of what you expect to see.
  - **When coding**: be aware when you're not making progress, so you can take a break or try a different strategy.
  - **When designing**:
    - Explain the tradeoffs with using a different data structure or algorithm.
    - If one or more requirements change, how would the solution change as a result?
    - Reflect on how you ruled out alternative ideas along the way to a solution.
  - **When studying**: what is the relationship of this topic to other ideas in the course?

Getting Help

- Discussion Board
  - Feel free to make a public or private post on Ed
  - We encourage you to answer other peoples' questions! A great way to learn
- Introductory Programming Lab (Office Hours)
  - TAs can help you face to face in office hours, and look at your code
  - You can go to the IPL with **any** course questions, not just assignments
- Section
  - Work through related problems, get to know your TA who is here to support you
- Your Peers
  - We encourage you to form study groups! Discord or Ed are great places to do that
- Email
  - We prefer that all content and logistic questions go on the Ed discussion board (even if you make them private). 737 of you >>> 239 of us!
  - For serious personal circumstances, you can email Miya directly. It never hurts to email me, but if it's a common logistic question, I may politely ask you to post on the discussion board.

Help Us Improve!

- This is a very new course! We are always looking for feedback on how to improve the class for you and for future students! Thank you in advance 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!

- Post on the discussion board (can be public/private).
  - Note: Anonymous here is anonymous to other students, not to the staff.

- Submit feedback via the **Anonymous Feedback Tool** (linked under "Course Tools" on the website)

The World Around CSE 122

- Our goal is to give you a great CSE 122 experience
  - But CSE 122 does not exist in a vacuum – there's a lot going on in the world right now that can impact your education
- We've designed course policies for maximum flexibility: ability to resubmit assignments and retake quizzes
  - But we cannot cover every individual situation
- **Please reach out** if you need accommodations of any kind to deal with these unfamiliar situations

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- Introductions
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Hello World

- Java Specifics
  - Every program needs a class
  - Runnable programs need a main method (*signature* must exactly match)
  - System.out.println to print
  - "Hello world" is a String

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

- Running on Ed
  - **Run** runs your program
  - **Mark** submits and runs autograder
    - Submit as many times as you like
    - “Shotgun submission” = Unhelpful habit
  - **Solution** shows solution (if applicable)

Review Java Syntax

Java Tutorial reviews all the relevant programming features you should familiar with (even if you don’t know them in Java).

- Printing and comments
- Variables, types, expressions
- Conditionals (if/else if/ else)
- Loops (for and while)
- Strings
- Methods
- File I/O
- Arrays

“Homework” for Next Time

- First assignment will be released Friday, but there are some things to do in the mean time.

- TODO this week
  - Fill out the introductory survey
  - Post an introduction video on your section’s Ed thread! 😊
  - Go meet your TA and classmates in Thursday’s quiz section
  - ☆ Complete the pre-class material for Friday (see calendar)
  - Check over syllabus details