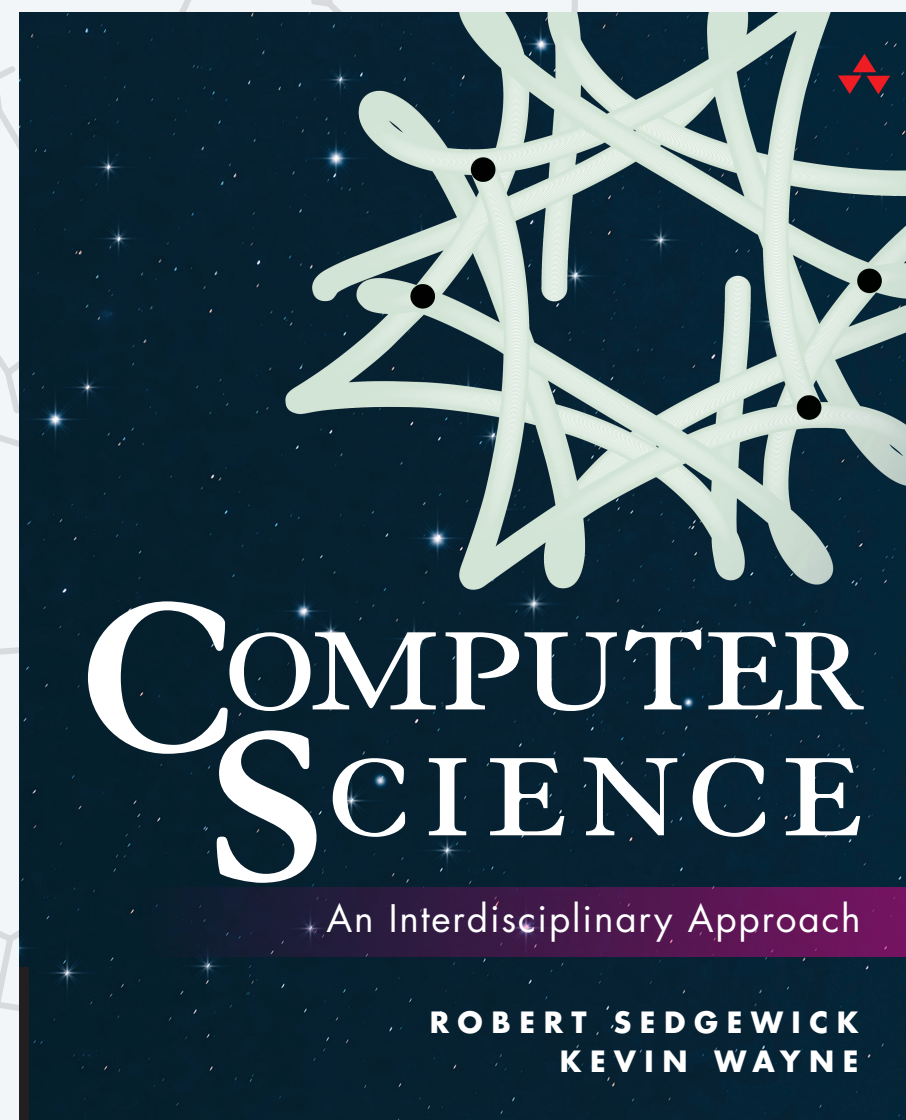




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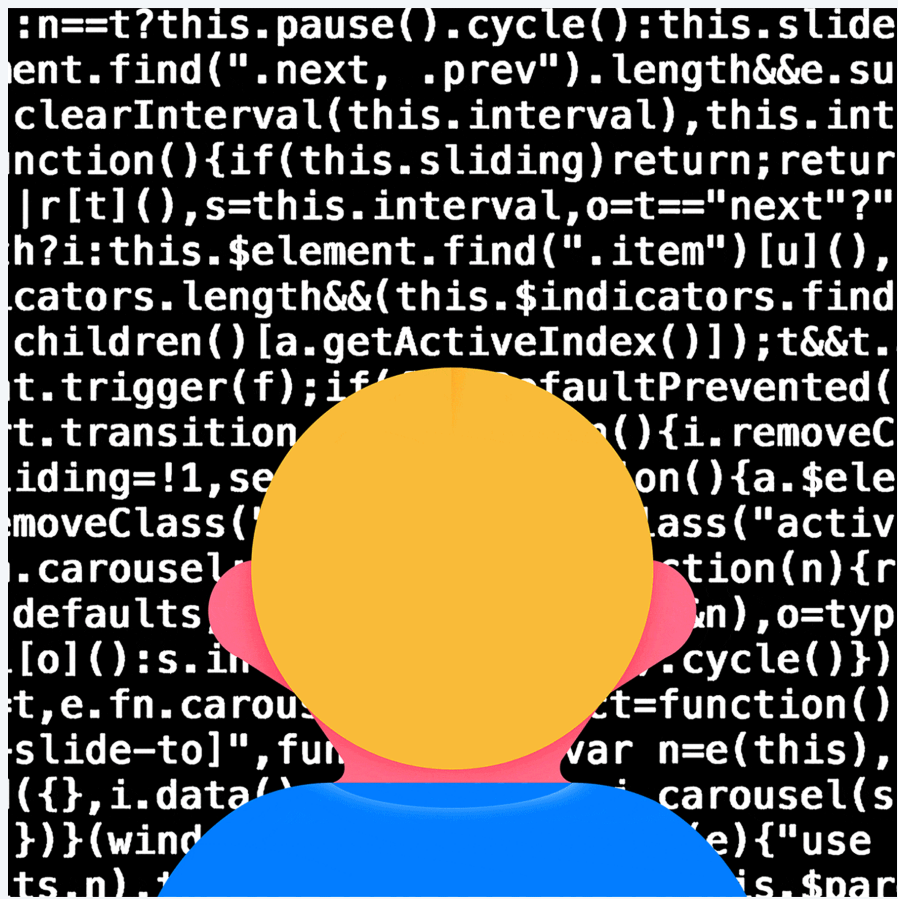
COS 126, FALL 2026

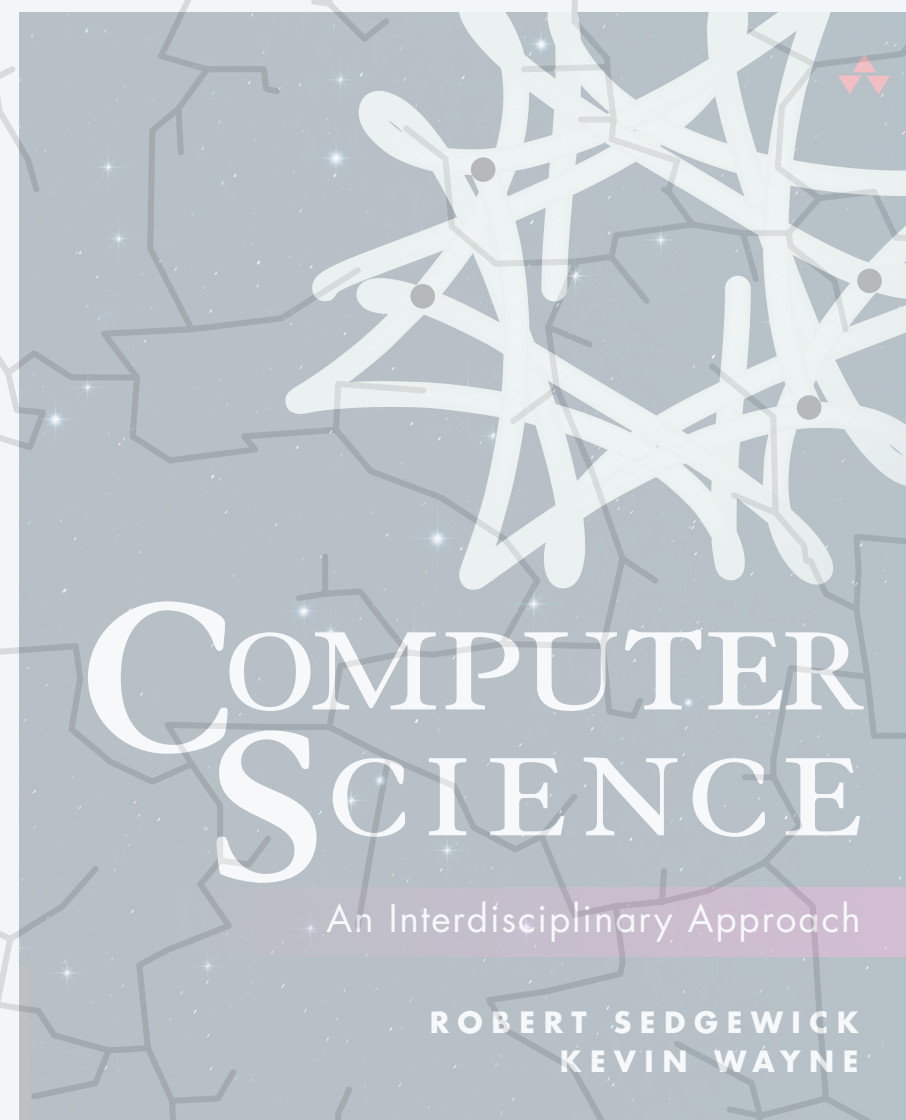
- ▶ *the digital revolution*
- ▶ *course mechanics*
- ▶ *support and resources*
- ▶ *questions*

COS 126 course goals

- Goal 1. Read, write, and reason about computer programs.
- Goal 2. Identify key ideas that underlie computation and computer systems.
- Goal 3. Apply these concepts to problems in science, engineering, and beyond.

Topic	Examples
elements of programming	<i>variables, types, conditionals, loops, arrays, I/O</i>
functions	<i>user-defined functions, modularity, recursion</i>
object-oriented programming	<i>user-defined types, encapsulation, immutability</i>
algorithms and data structures	<i>sorting, searching, linked lists, BSTs</i>
computer science	<i>theory of computing, machine learning</i>
design of computers	<i>machine language, Boolean logic, circuits</i>





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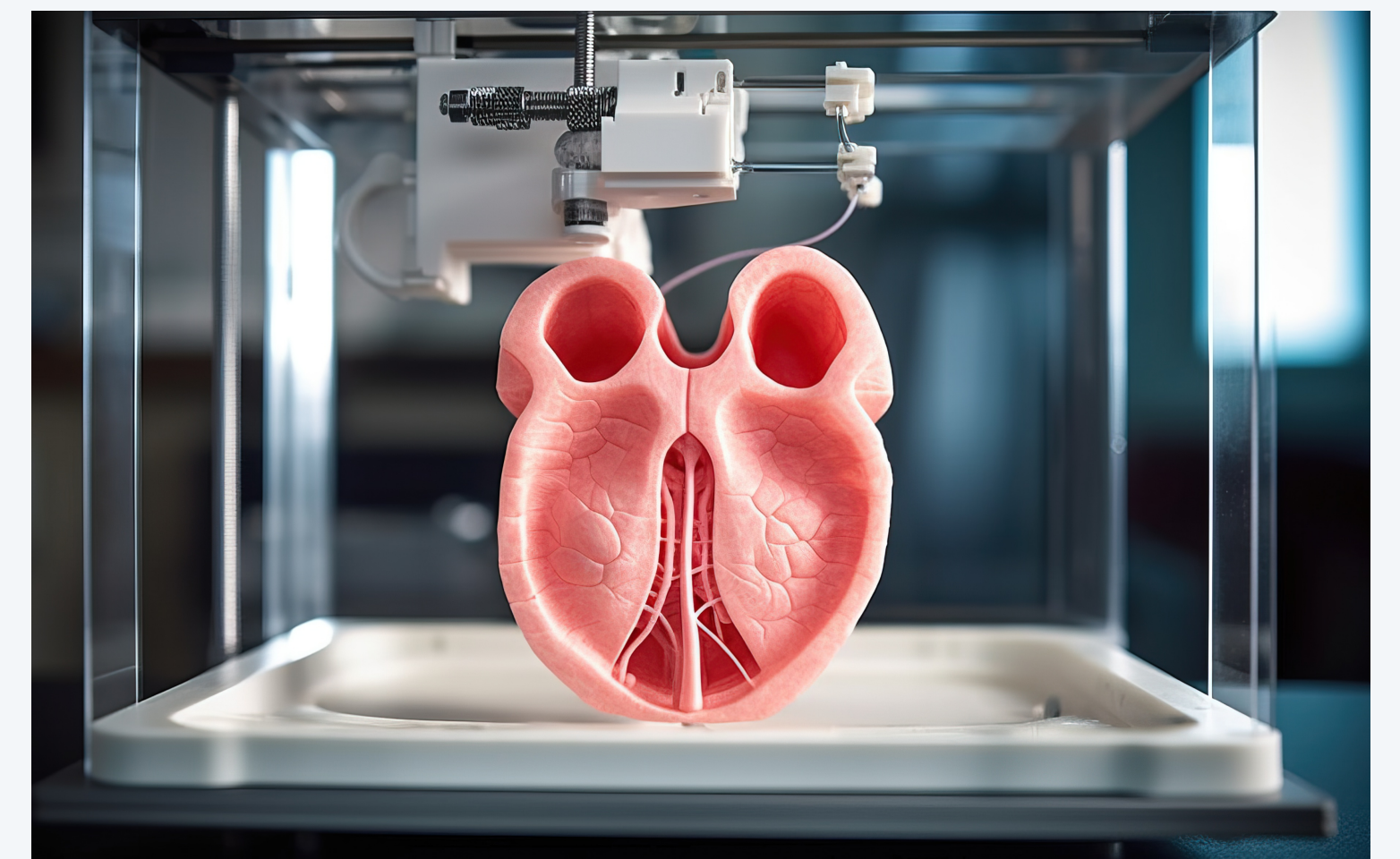
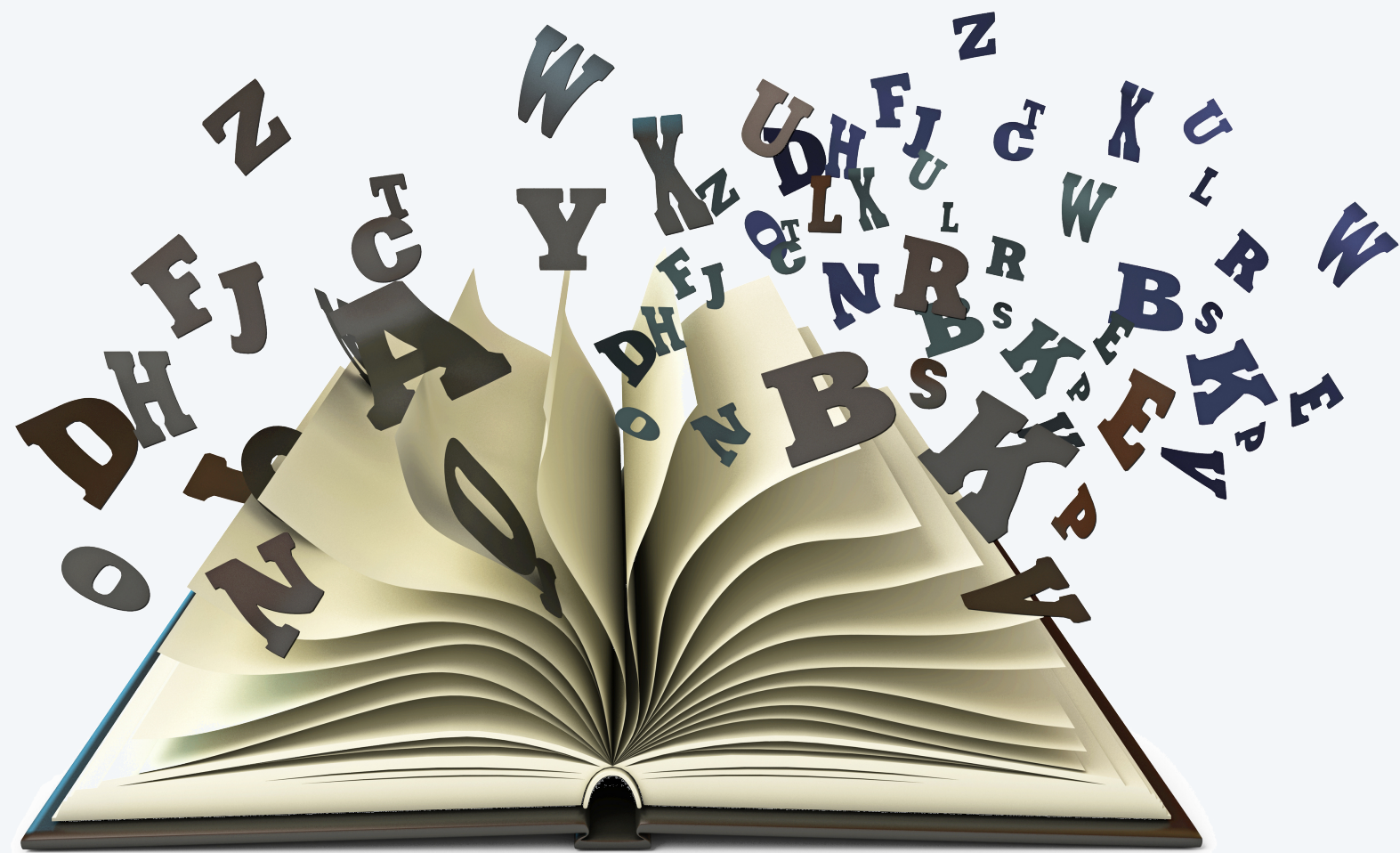
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- ▶ *the digital revolution*
- ▶ *course mechanics*
- ▶ *support and resources*
- ▶ *questions*

The digital revolution

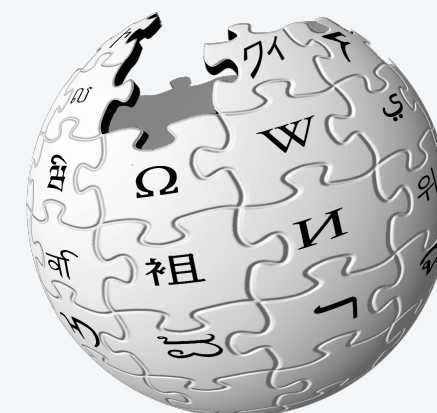
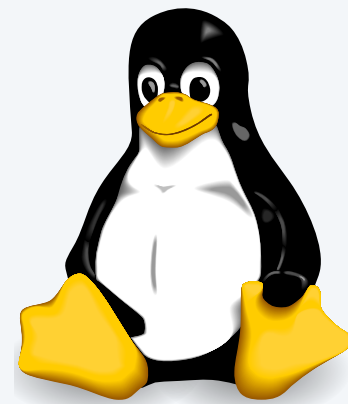
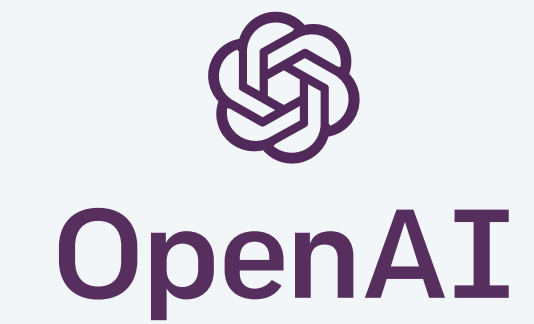
Key idea. Any kind of information can be encoded as a sequence of **bits** (0s and 1s).

- Numbers and text.
- Pictures, music, and video.
- Biometrics (fingerprints, DNA, ...).
- 3D objects and models.
- Computer programs.
- ...



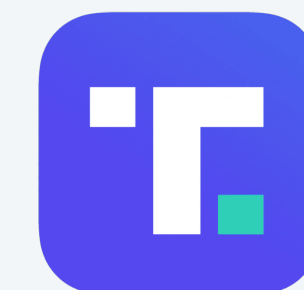
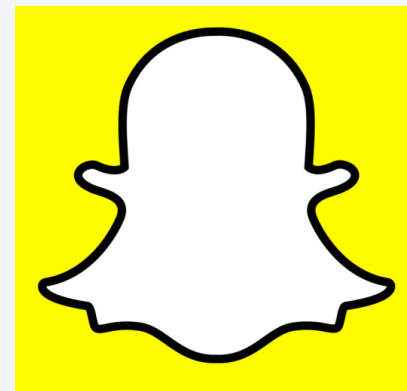
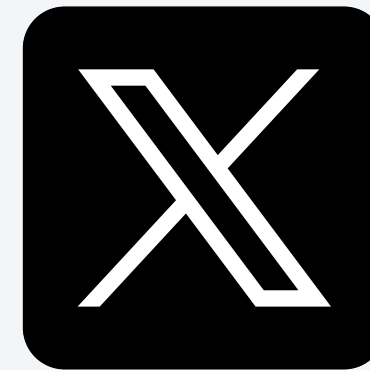
Computers are transforming society

From the way we work ...



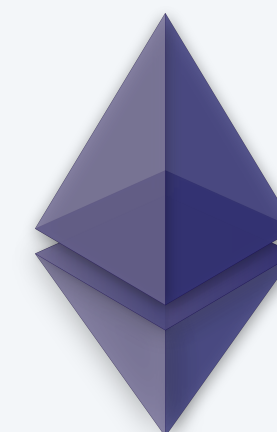
Computers are transforming society

... to the way we live.



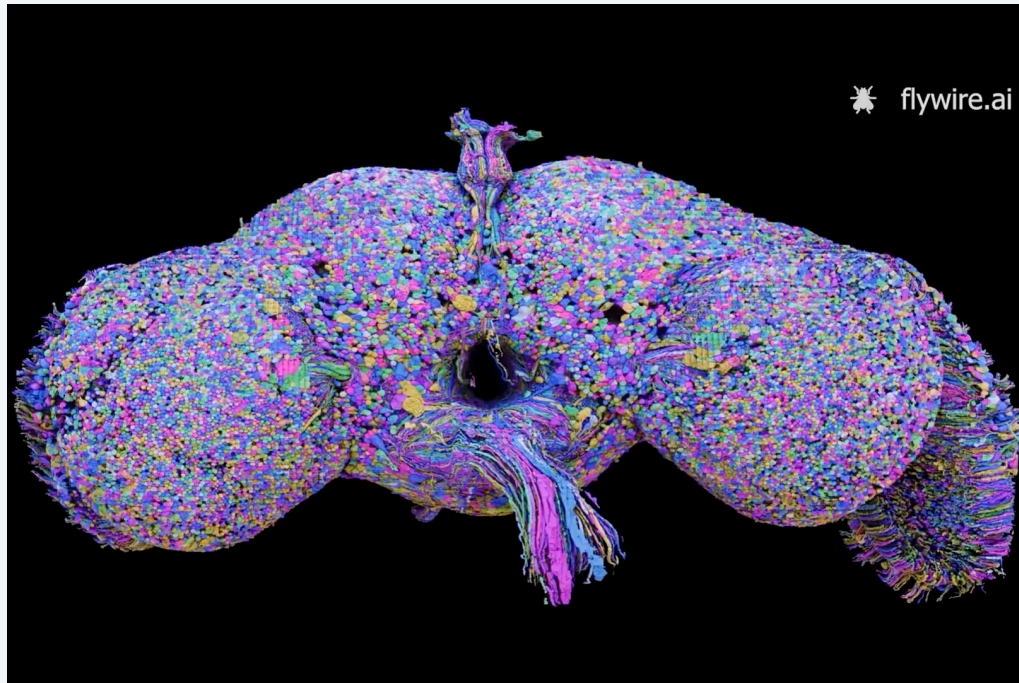
Computers are transforming society

From the “new” economy ...

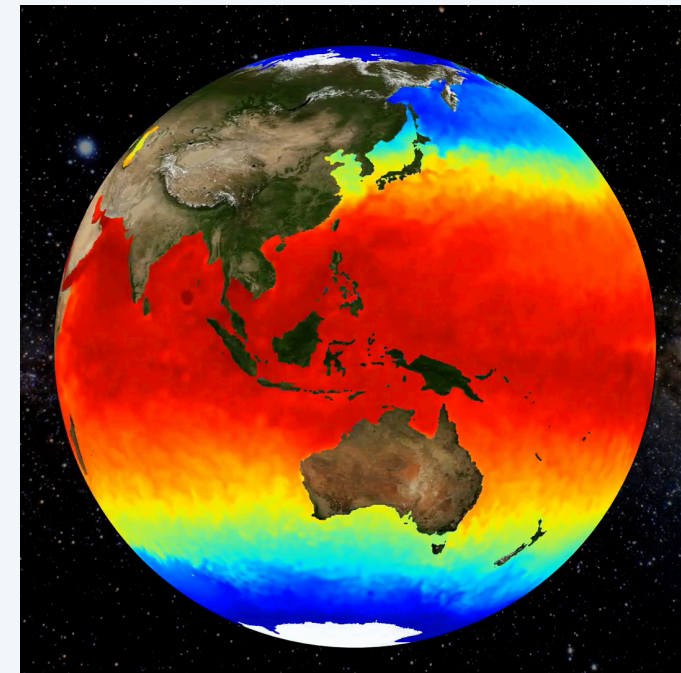


Computers are transforming society

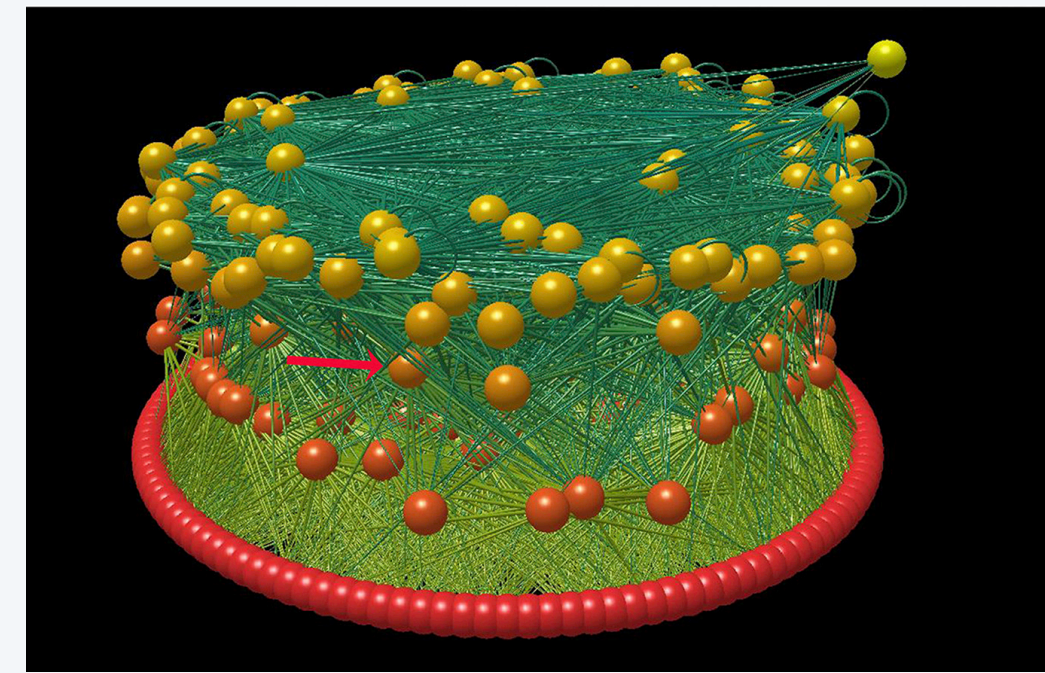
... to the way we do science and engineering.



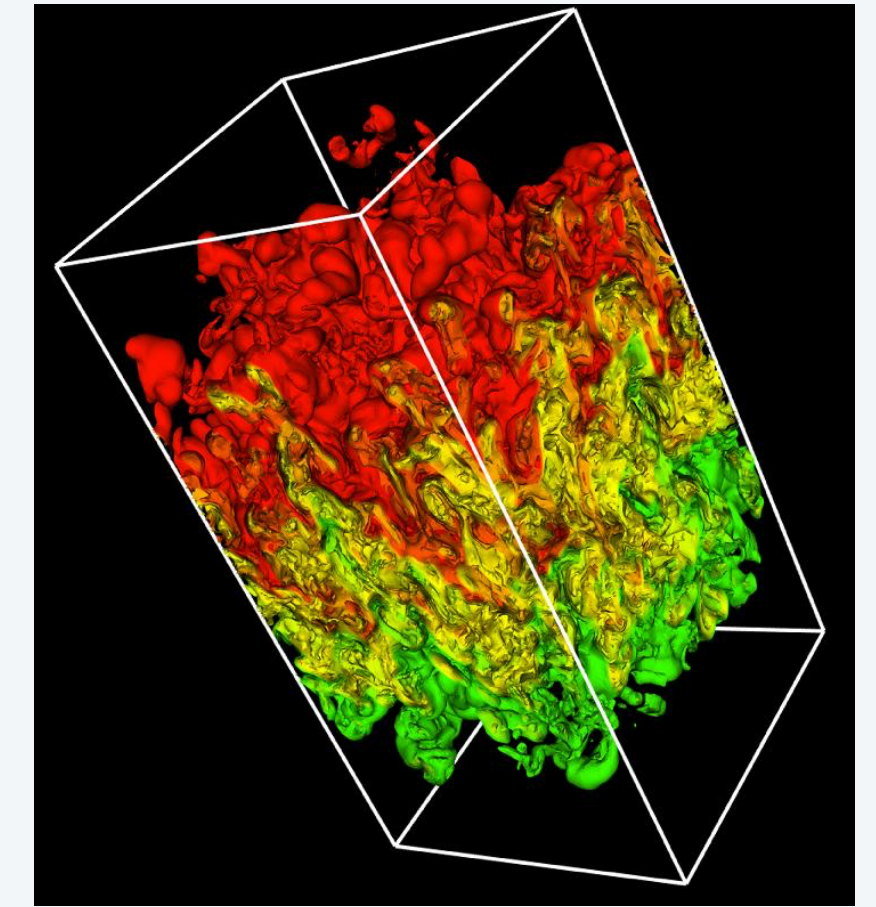
fruit fly brain



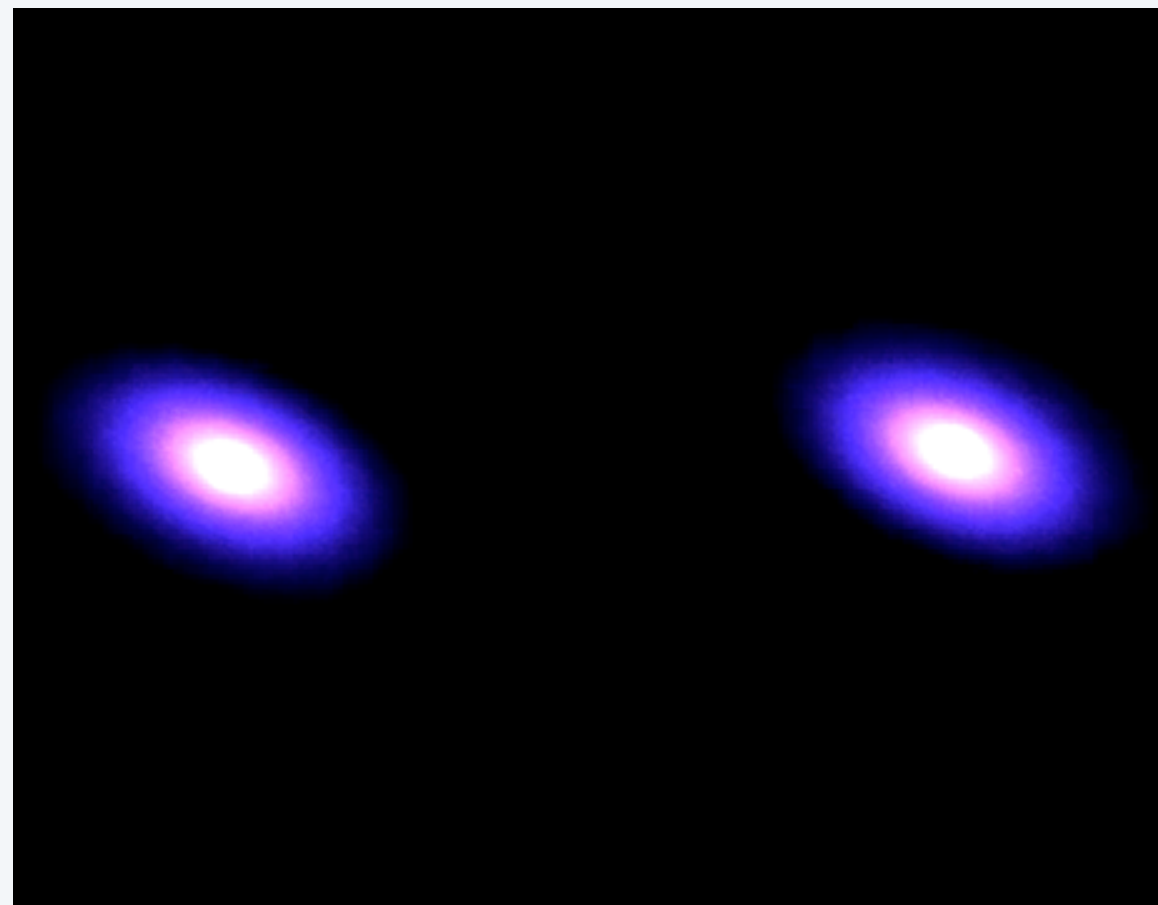
ocean modeling



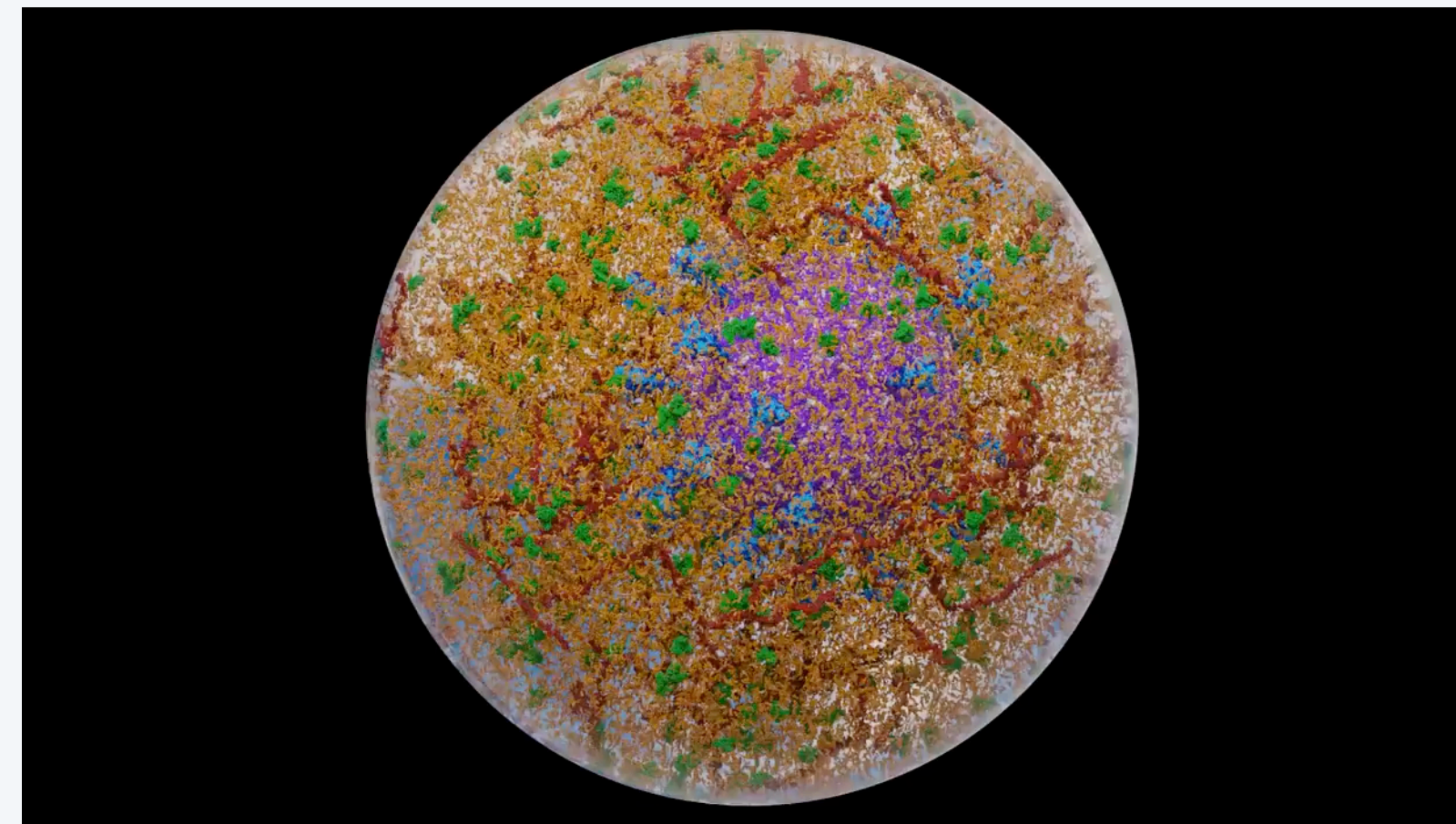
ancestral Pueblo food web



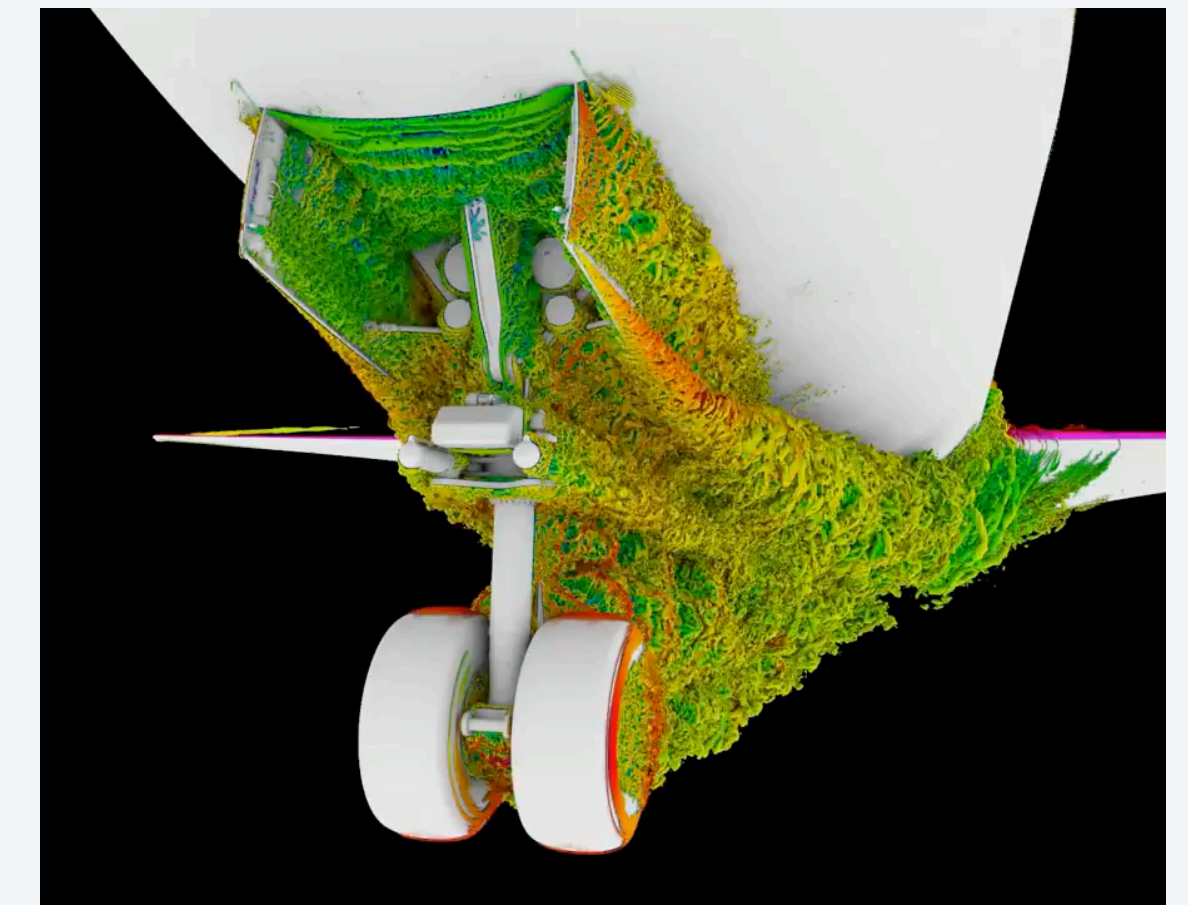
nuclear physics



colliding galaxies



an aerosol droplet containing coronavirus



airflow over landing gear

Digital revolution accelerated by AI

Disruption in every sector of society.

Including software engineering!

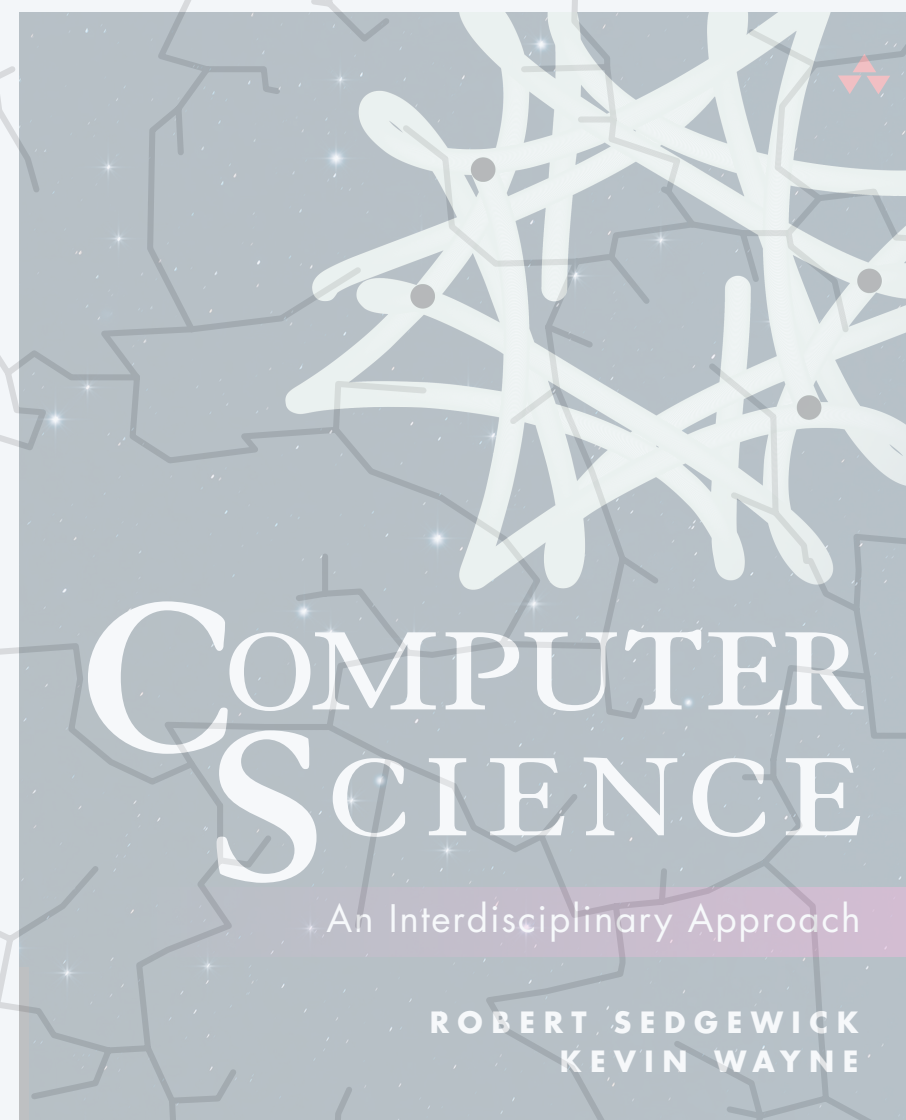
- Q1: *Why take this class?*
- Q2: *Why not use generative AI in this class?*

Why take this class in the era of AI tools?

- Foundation for understanding the nature of AI tools.
- Human–AI partners are better than AI alone.
- Much more than programming.
 - How computer systems work
 - Theory of computation
 - Computational abstractions

Why not use generative AI in this class?

- We do use it in subsequent COS classes.
- Use of GAI thwarts learning.
- Language influences thought.
 - Learning to program enhances “computational thinking.”



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COS 126, FALL 2026

- ▶ *the digital revolution*
- ▶ *course mechanics*
- ▶ *support and resources*
- ▶ *questions*

Lectures

Attend live lectures. New content.

Download lecture slides. Course website (Schedule).

Watch lecture recordings. Canvas (Panopto Video).

Questions. Please participate.

- Raise your hand in lecture. ← *carpe diem!*
- Post on Ed. ← *staff monitor Ed and respond regularly*

Electronic devices. Use only for class (slides, notes, iClickers).





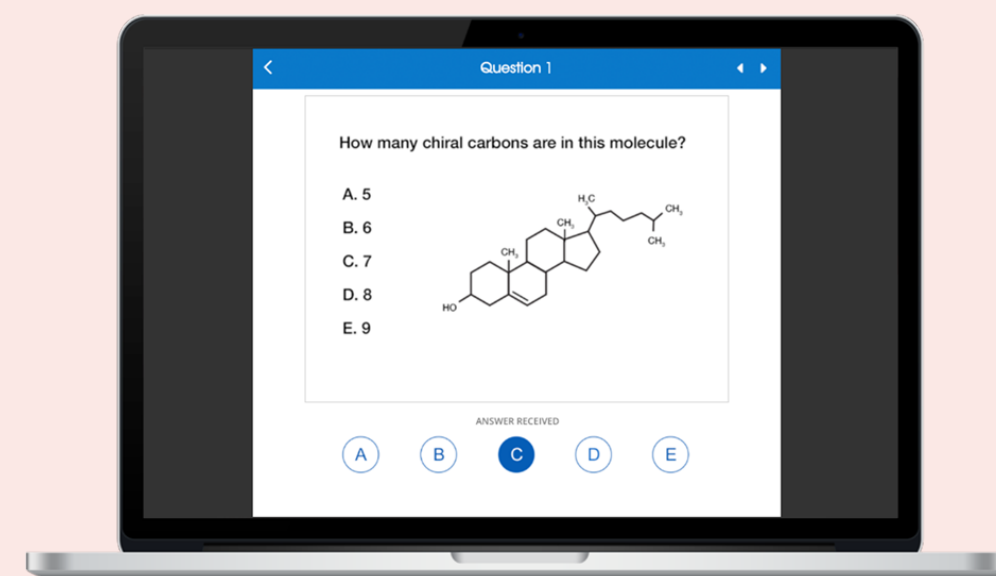
iClicker. To earn participation credit:

- Create an iClicker Cloud account.  *use your Canvas-preferred email*
- Register for this course.
- Answer multiple-choice questions during lecture.

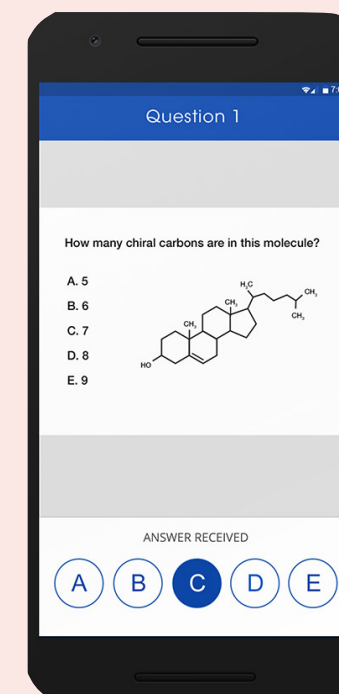


<https://www.iclicker.com>

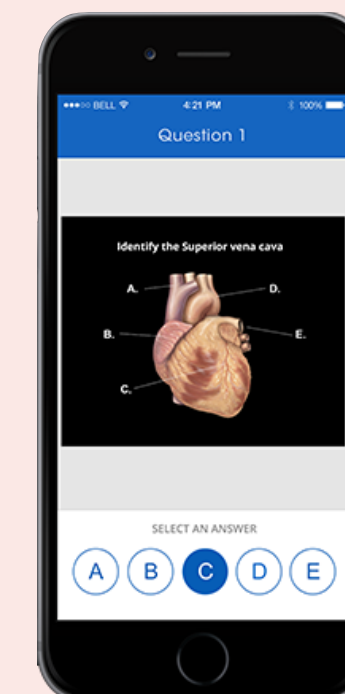
How are you using iClicker today?



A. Web



B. iPhone



C. Android

Precepts

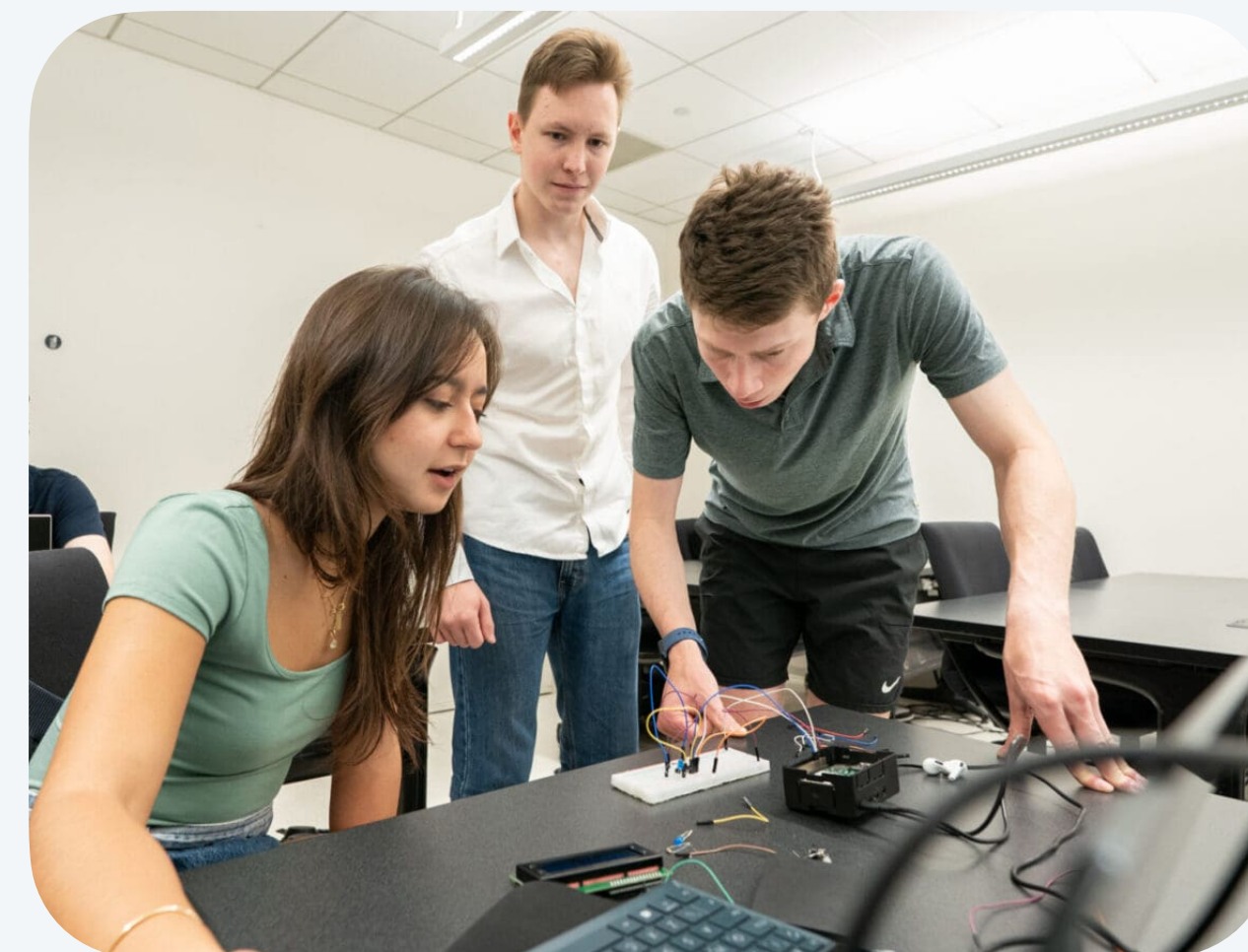
Active learning: discussion, problem solving, pair programming, ...

- 50-minute precepts.
- 80-minute precepts.
- Raspberry Pi 🍷 precept (P13).

← *same content; different pace*

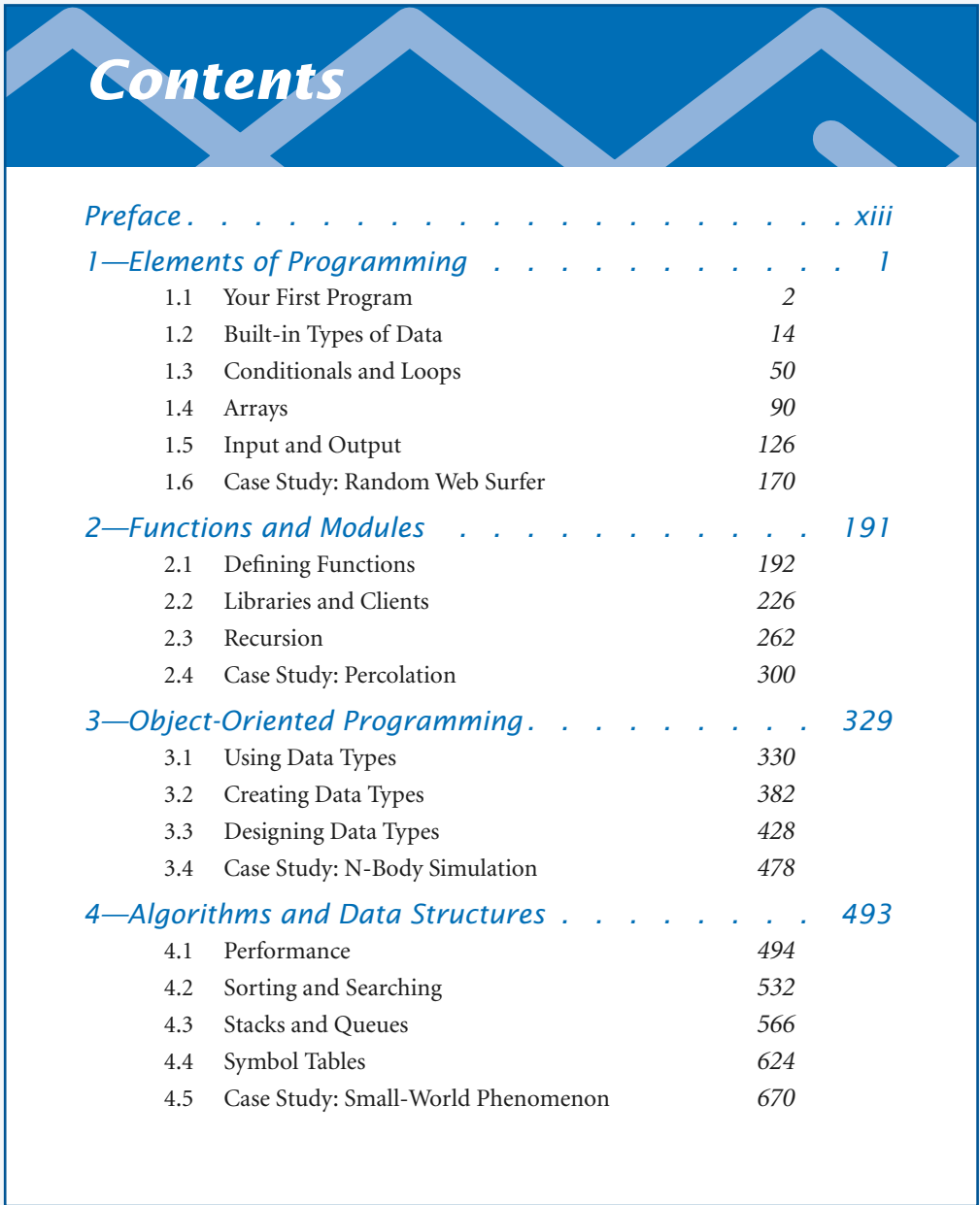
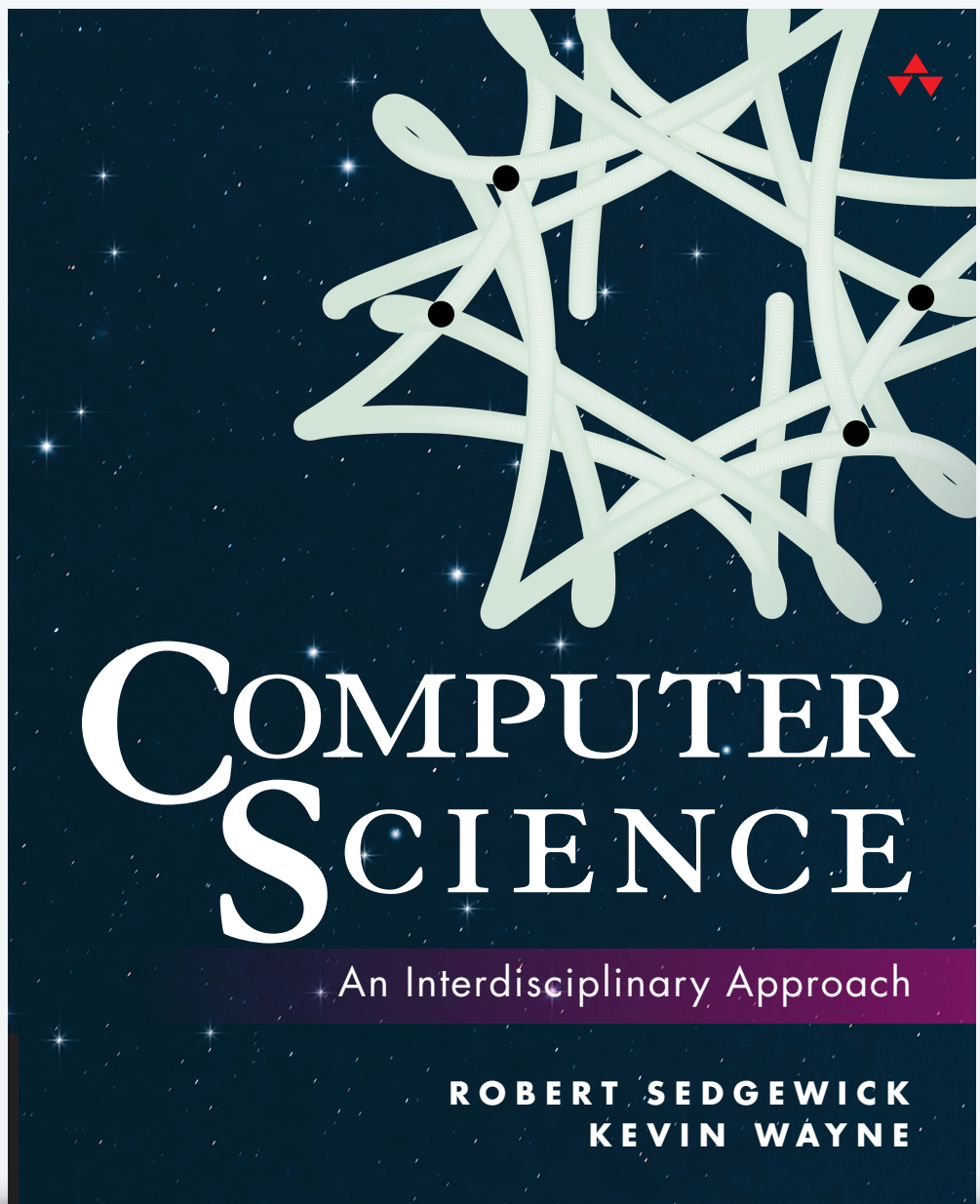


Interested? See Prof. Alan Kaplan after class.



Textbook (required). *Computer Science: An Interdisciplinary Approach* (Sedgewick and Wayne).

- Written to accompany COS 126.
- Read the assigned section before lecture.
- Available via Princeton eCampus bookstore.



<i>Preface</i>	<i>xiii</i>
<i>1—Elements of Programming</i>	<i>1</i>
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2.3 Recursion	262
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3.3 Designing Data Types	428
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<i>4—Algorithms and Data Structures</i>	<i>493</i>
4.1 Performance	494
4.2 Sorting and Searching	532
4.3 Stacks and Queues	566
4.4 Symbol Tables	624
4.5 Case Study: Small-World Phenomenon	670

Grading breakdown A+

Programming assignments. Due Sundays at 11:59pm.

Code review. Get feedback; explain your code.

Programming project. Capstone assignment.

Midterm exam. October 14 (in lecture).

Final exam. December 20, 4–7pm.

Participation. Lecture and precept participation.

Course grade. Determined by your weighted average and fixed cutoffs; no curve.

Graded component	Weight
<i>Prog. Assignments (testing)</i>	18%
<i>Prog. Assignments (review)</i>	12%
<i>Capstone project</i>	5%
<i>Midterm exam</i>	25%
<i>Final exam</i>	35%
<i>Participation</i>	5%

Grade	A	A–	B+	B	B–	...
Cutoff	93%	90%	87%	83%	80%	...

Programming assignments

Programming is essential to learning computer science.

Programming assignments goals.

- Illustrate a fundamental CS concept.
- Apply a new programming construct.
- Highlight the role of computation in an important domain.
- Solve real problem from scratch, on your own computer!

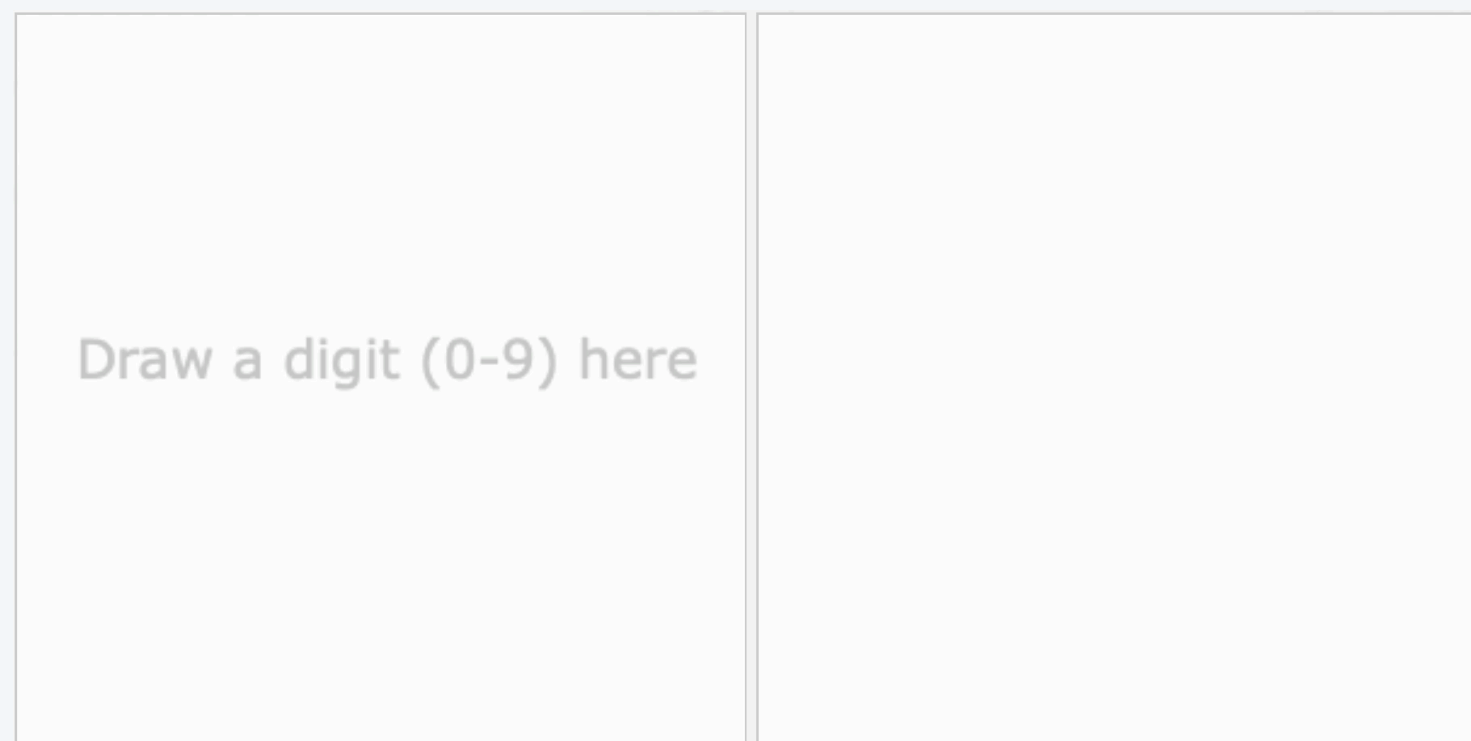


Image Classifier
(Assignment 8)



Guitar Hero
(Assignment 6)

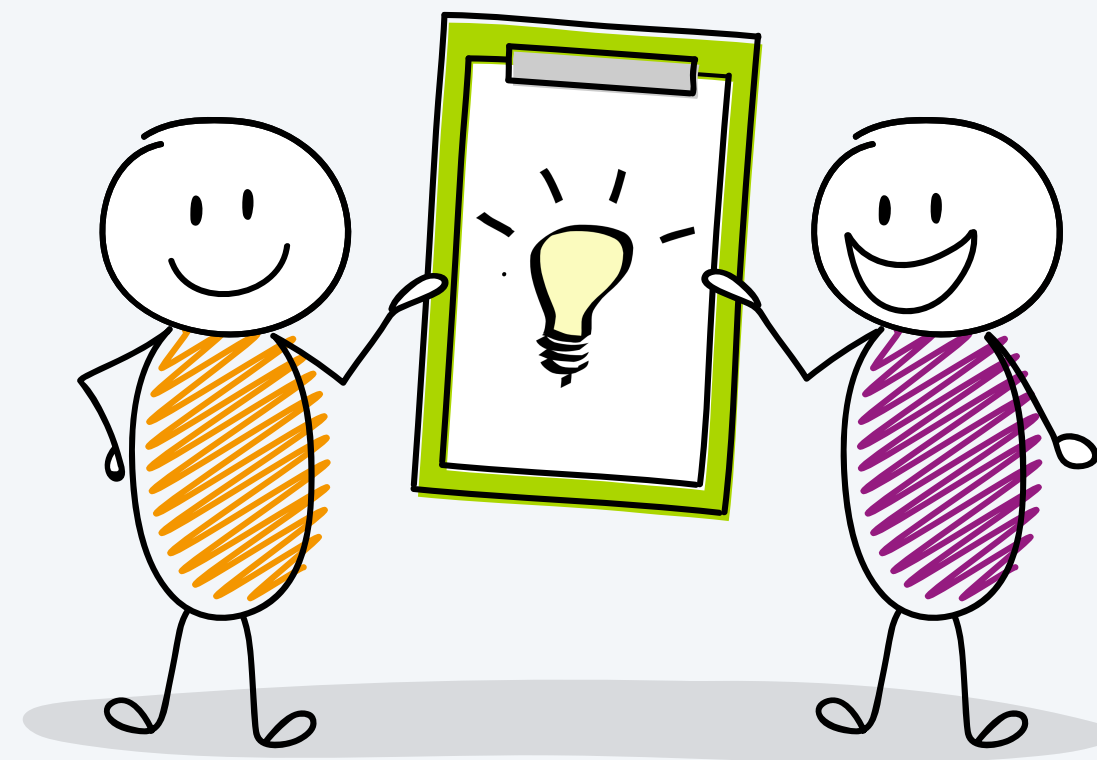
Programming assignments: collaboration policies



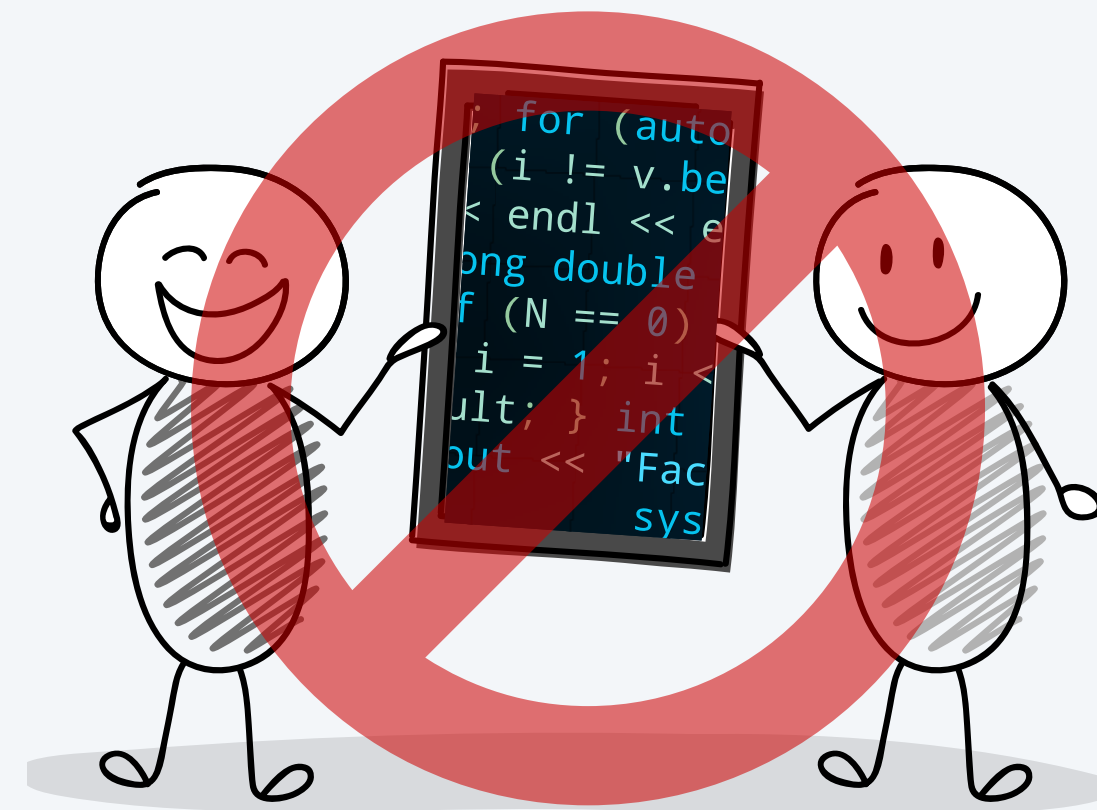
Executive summary.

- **Do** discuss concepts with others.
- **Do** acknowledge any collaboration.
- **Do** partner with a classmate on designated assignments.
- **Do not** copy code from classmates, online source, or generative AI tools.

For full details, see the course syllabus.



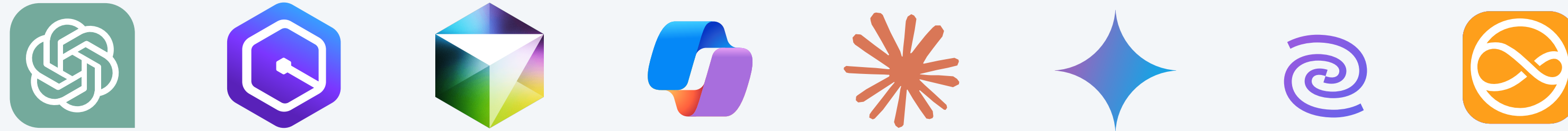
share ideas



don't share code

Generative AI tools

GenAI policy. Using GenAI on any graded COS 126 work is **prohibited**.



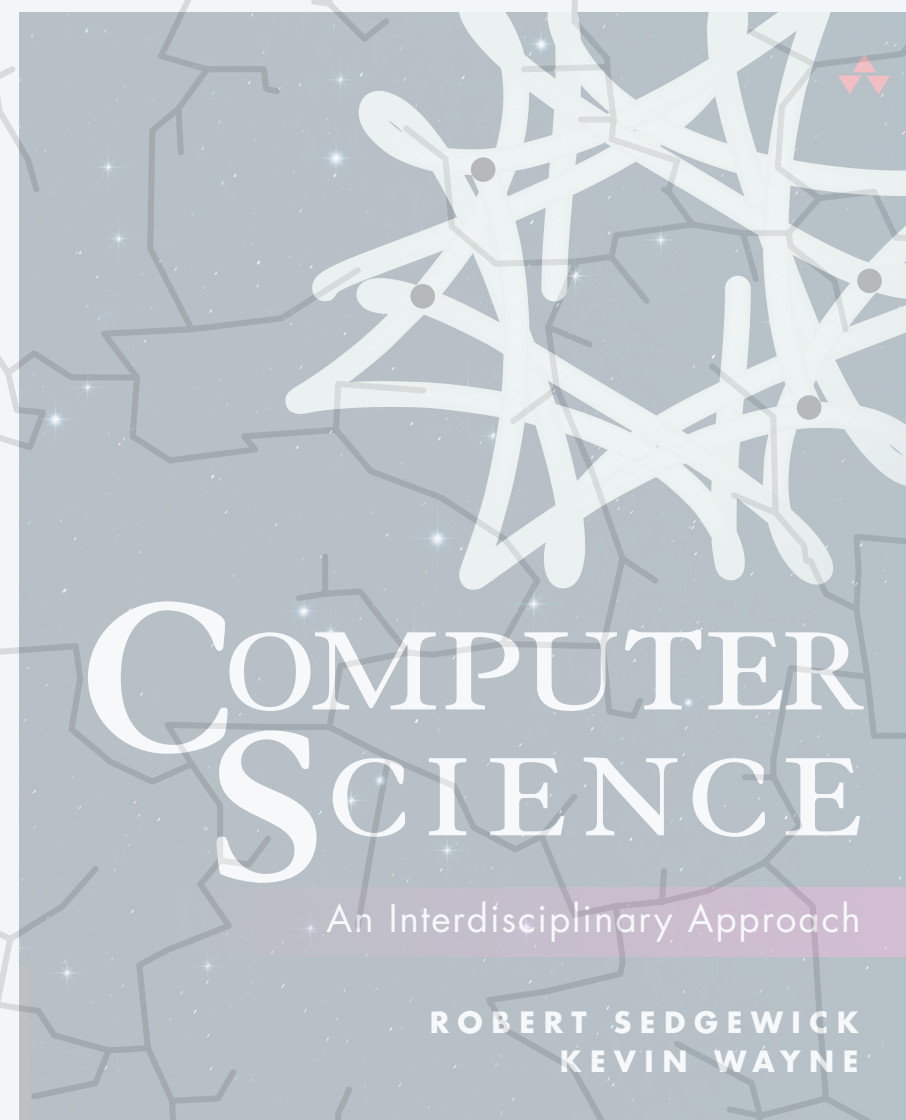
Pedagogical rationale.

- Build a strong foundation in programming.
- Strengthen problem-solving and critical-thinking skills.
- Prepare to use GenAI effectively and responsibly in the future.
- Succeed on exams and technical interviews.



Warning. We routinely detect GenAI use and refer cases to the CoD.





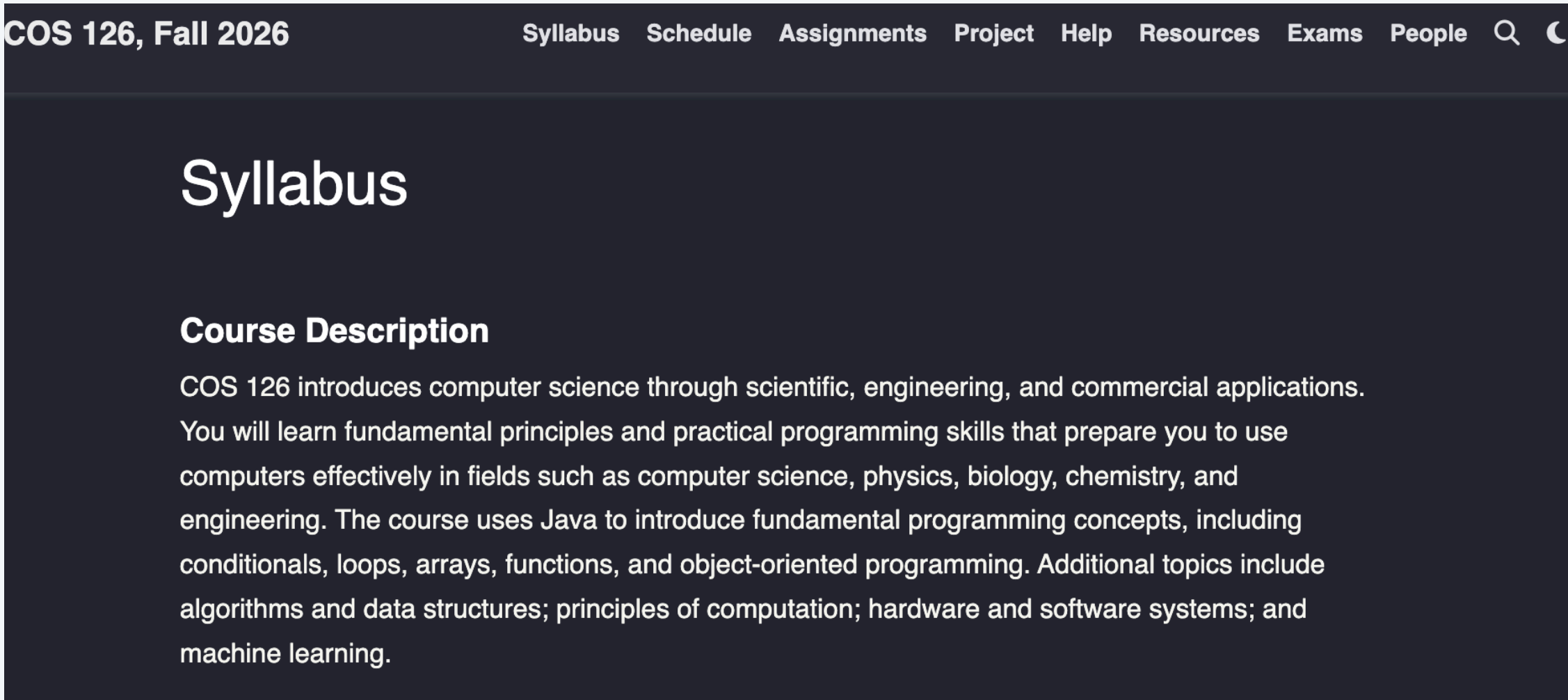
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COS 126, FALL 2026

- ▶ *the digital revolution*
- ▶ *course mechanics*
- ▶ *support and resources*
- ▶ *questions*

Course website.

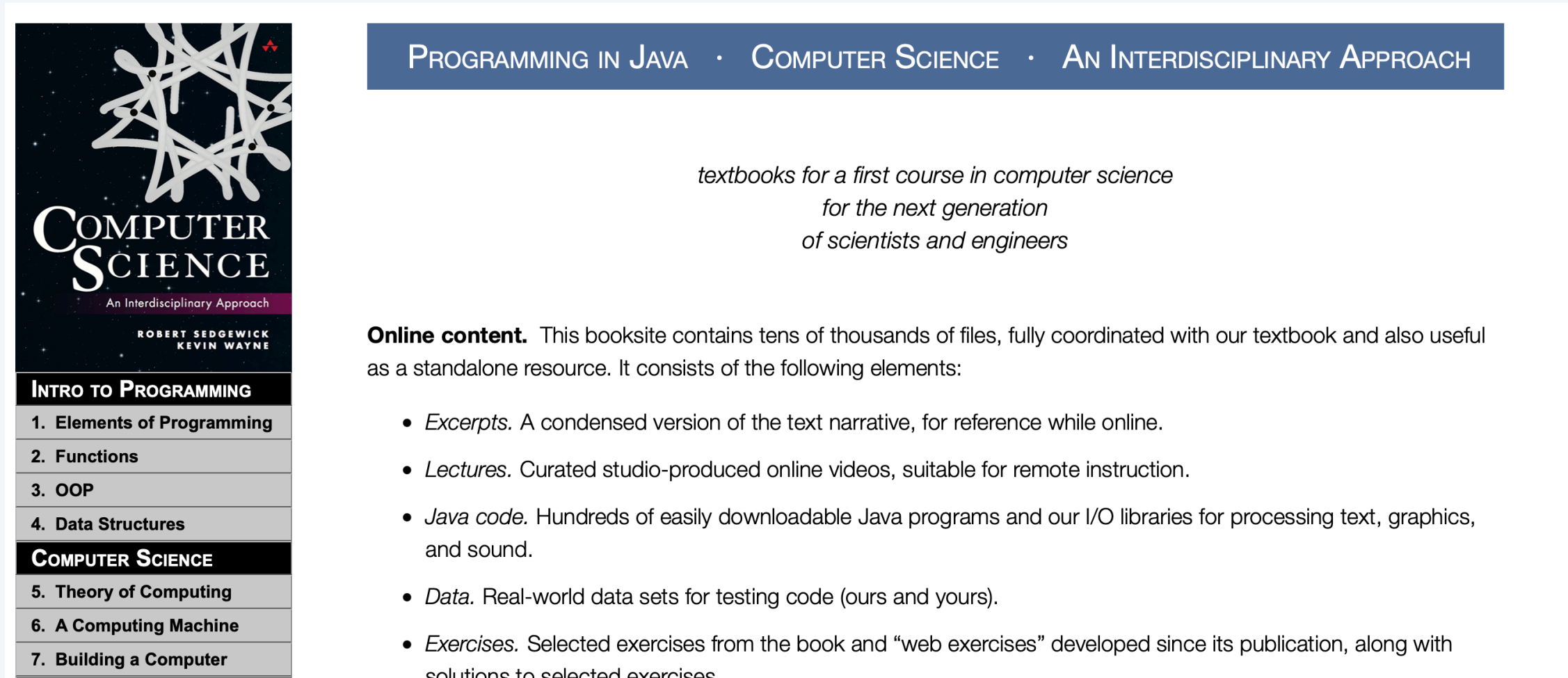
- Syllabus and course policies.
- Lecture slides.
- Programming assignments.
- Exam archive.
- Getting help (office hours, Ed, ...).
- ...



<https://www.princeton.edu/~cos126>

Book website (booksite).

- Brief chapter summaries.
- Downloadable code from the textbook.

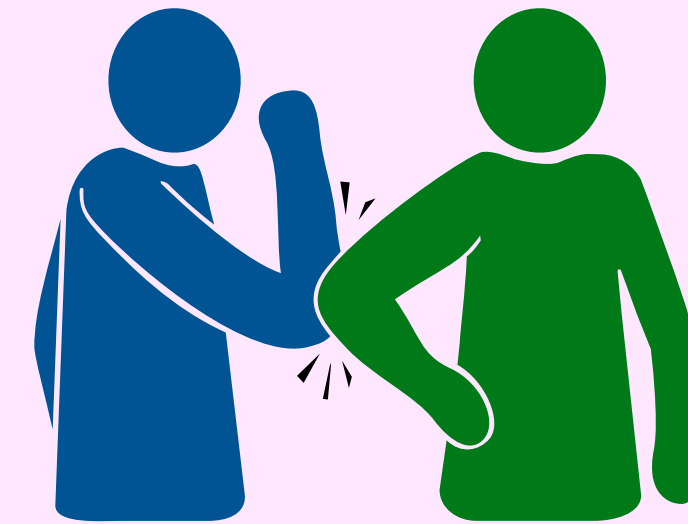


<https://introcs.cs.princeton.edu>

Your classmates

Meet a classmate near you (someone you don't know).

- Introduce yourself.
- Share why you're taking COS 126.
- Share one fun fact.
- Optional: exchange contact info.



Ed Discussion forum.  *please use Ed, not email*

- For short questions.
- Read the Ed FAQ for etiquette.



<https://edstem.org/us/courses/99455>

Office hours.  *protip: attend*

- For longer discussions.
- See the course website for the schedule.



<https://www.princeton.edu/~cos126>

Intro COS Lab.  *opens Friday*

- Run by undergrads.
- For help with debugging.

McGraw drop-in study halls.

- Led by undergrads.
- For help with concepts.



<https://introlab.cs.princeton.edu>

The McGraw Center
for Teaching & Learning



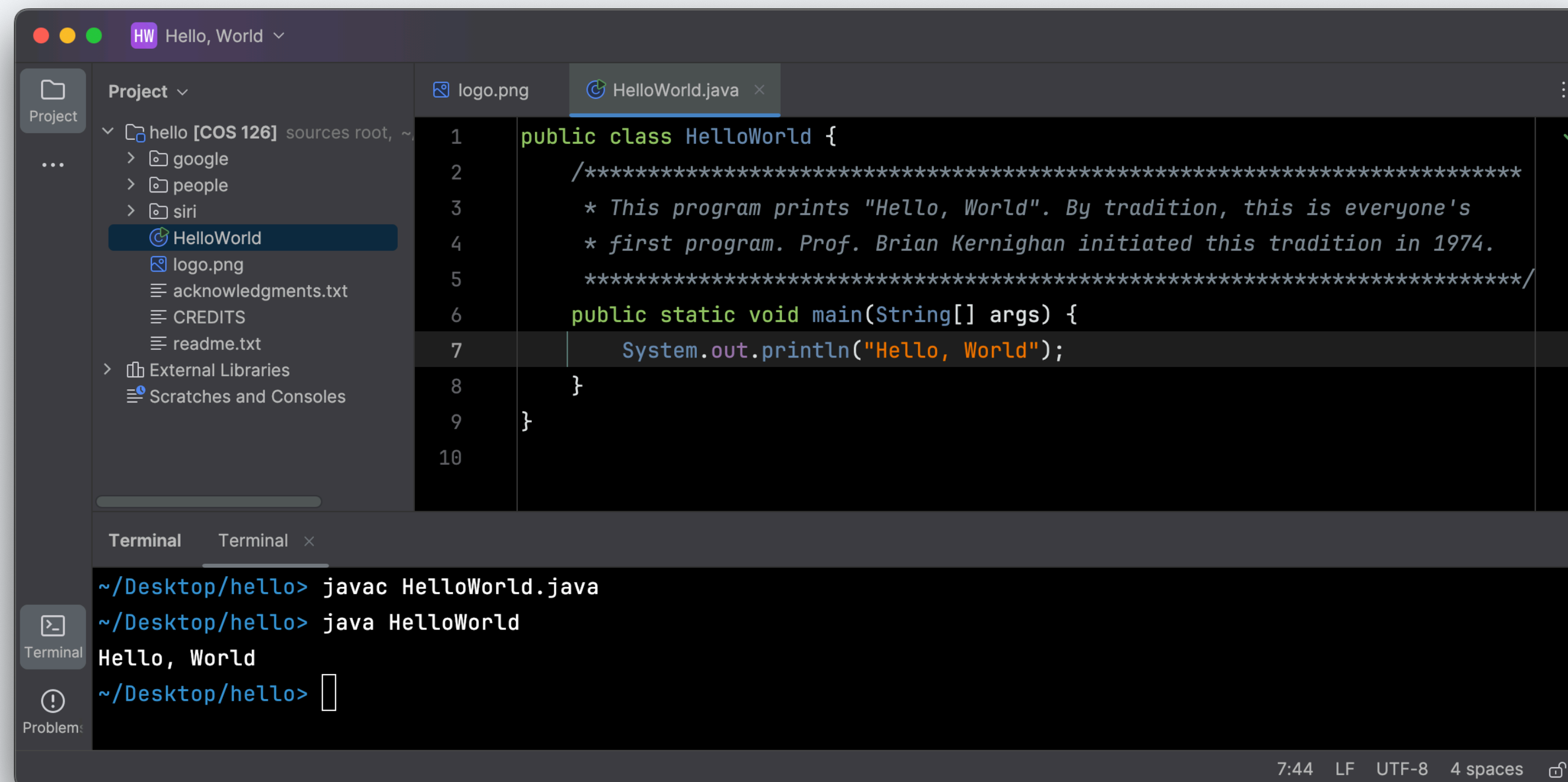
<https://mcgraw.princeton.edu/undergraduates>

Programming environment (IntelliJ)

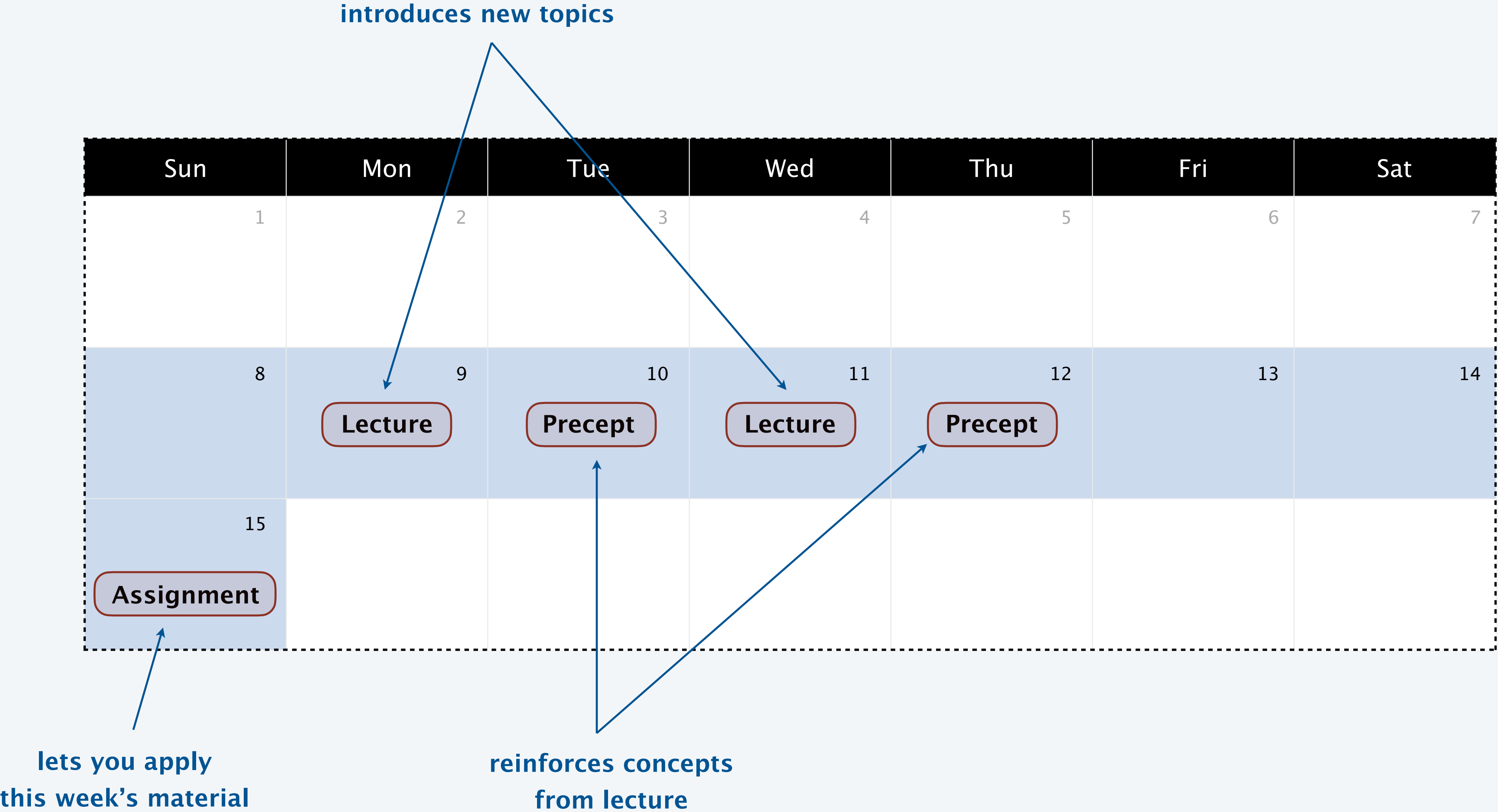


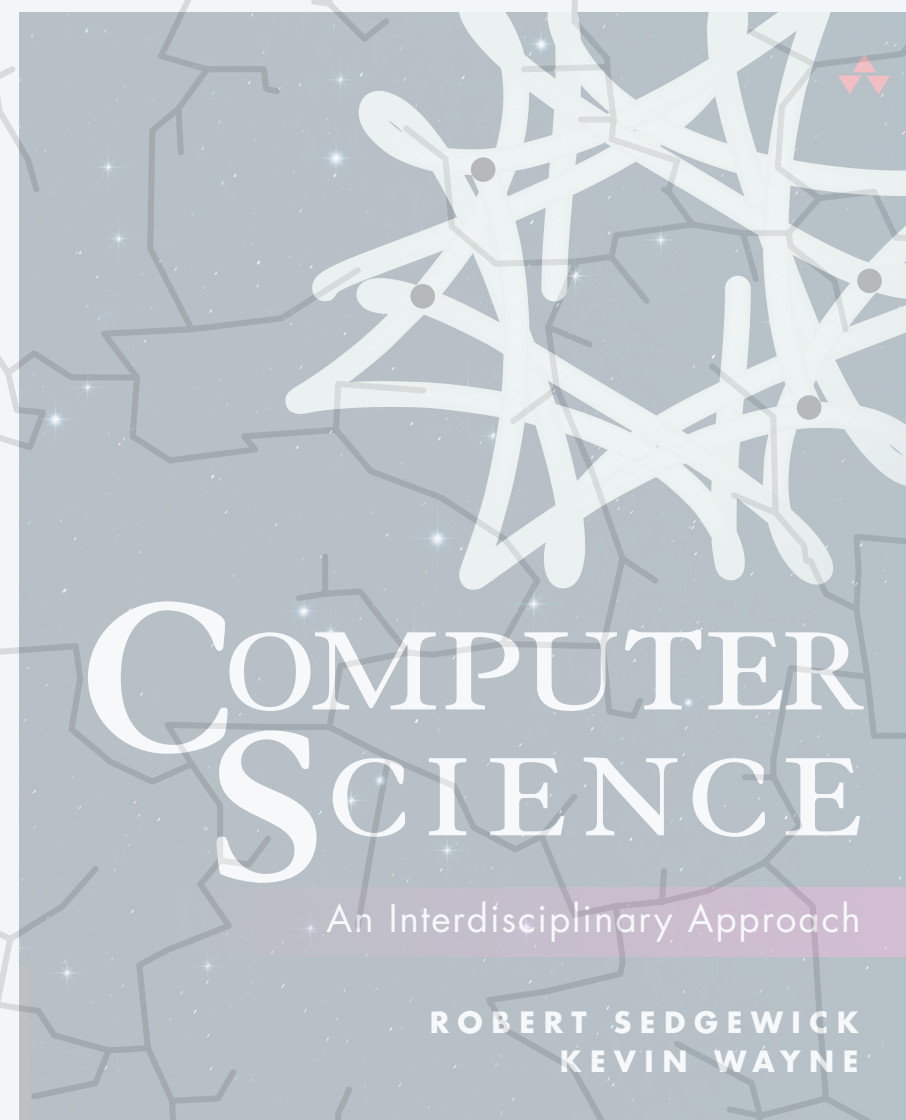
Recommended IDE. Custom IntelliJ 2026.2 setup.  *use our fall 2026 version
(see lab TAs for troubleshooting)*

- Embedded terminal (Bash).
- Highlights common errors as you type.
- Automatic formatting, imports, and code completion.
- ...



A typical week in COS 126





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COS 126, FALL 2026

- *the digital revolution*
- *course mechanics*
- *support and resources*
- ***questions***

How to ask a question?

- Raise your hand and ask.
- Post on Ed.



raise your hand and ask



post on Ed



Credits

media	source	license
<i>Crowd Cheering</i>	<u>YouTube</u>	
<i>Wireframe Tiger</i>	Audrey Cheng '20	by author
<i>Recording</i>	<u>Adobe Stock</u>	<u>education license</u>
<i>Programmer</i>	<u>Wall Street Journal</u>	
<i>Albert Einstein</i>	<u>Wikimedia</u>	<u>public domain</u>
<i>Binary Tunnel</i>	<u>Adobe Stock</u>	<u>education license</u>
<i>Open Book with Letters</i>	<u>Adobe Stock</u>	<u>education license</u>
<i>Panda in Snow</i>	<u>Smithsonian National Zoo</u>	<u>public domain</u>
<i>DNA Sequencing</i>	<u>Adobe Stock</u>	<u>education license</u>
<i>3D Printer</i>	<u>Adobe Stock</u>	<u>education license</u>
<i>Fortran Punch Card</i>	<u>Wikimedia</u>	<u>CC BY-SA 2.5</u>

Credits

media	source	license
<i>Ocean Modeling</i>	<u>JPL / NASA</u>	<u>public domain</u>
<i>Fruit Fly Brain</i>	<u>FlyWire Brain</u>	<u>CC BY-NC 4.0</u>
<i>Pueblo Food Web</i>	<u>Stefani Crabtree</u>	
<i>Nuclear Physics</i>	<u>FLASH Center</u>	
<i>Colliding Galaxies</i>	<u>YouTube</u>	
<i>Airflow Over Landing Gear</i>	<u>NASA Ames Research Center</u>	<u>public domain</u>
<i>Coronavirus Simulation</i>	<u>New York Times</u>	
<i>McCosh 50</i>	<u>Figueras Seating</u>	
<i>Handwritten Digit Demo</i>	<u>Adam Smith</u>	
<i>Stairway to Heaven</i>	Led Zeppelin	

Credits

media	source	license
<i>Collaborating Hands</i>	<u>Flaticon</u>	<u>Flaticon license</u>
<i>Cartoon People Sharing</i>	<u>Adobe Stock</u>	<u>education license</u>
<i>Light Bulb Idea</i>	<u>Clker-Free-Vector-Images</u>	<u>Pixabay</u>
<i>Ice Breaker</i>	<u>Adobe Stock</u>	<u>education license</u>
<i>Countdown Timer</i>	<u>YouTube</u>	
<i>Office Hours</i>	<u>clipground.com</u>	<u>CC BY 4.0</u>
<i>COS Lab TAs</i>	<u>Pulkit Singh '20</u>	by author
<i>McGraw Center</i>	<u>McGraw Center</u>	
<i>Student Raising Hand</i>	<u>classroomclipart.com</u>	<u>educational use</u>
<i>Question Marks</i>	<u>pikpng.com</u>	<u>non-commercial use</u>