Welcome to CSO1!

Puzzle Time!

Chat with your neighbors!

Can you make this board drop 3 blue marbles, then capture the next?

What about 4 marbles, then capture the next?

https://tumble-together.herokuapp.com
Menu: Challenges: #16 (then #23)

Welcome to CSO1!

CS 2130: Computer Systems and Organization 1

Fall 2025

Some Updates...

If you need to switch labs:

- Form will be coming soon
- Must be justified (i.e. class conflicts)
- **Very** limited space to make swaps

Why CS 2130?

What is CS 2130?

Where are we going?

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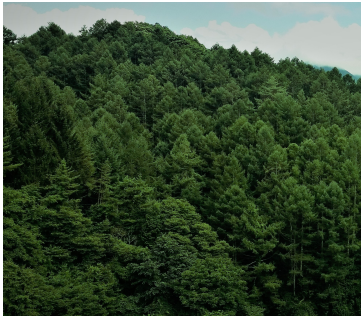

Where are we going?

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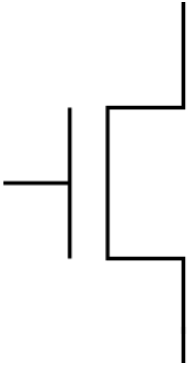
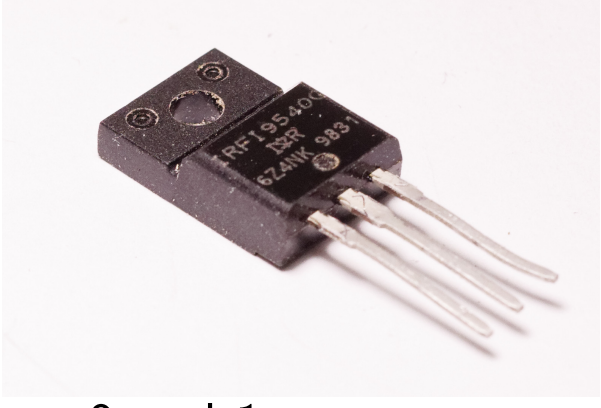
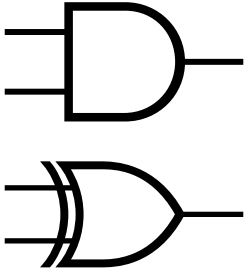




0 and 1

Where are we going?



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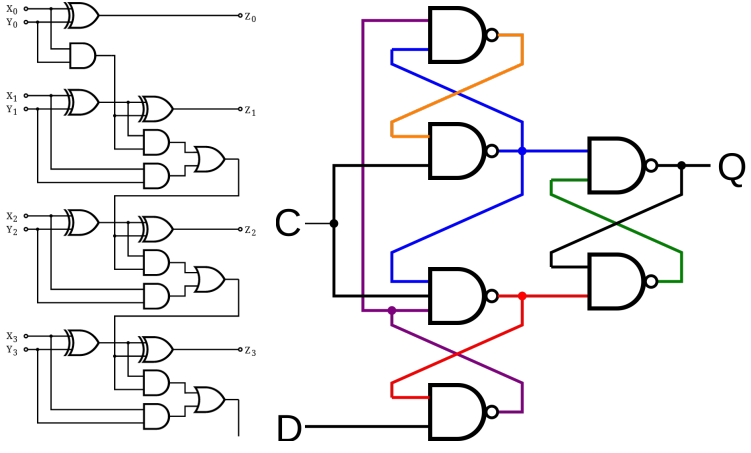

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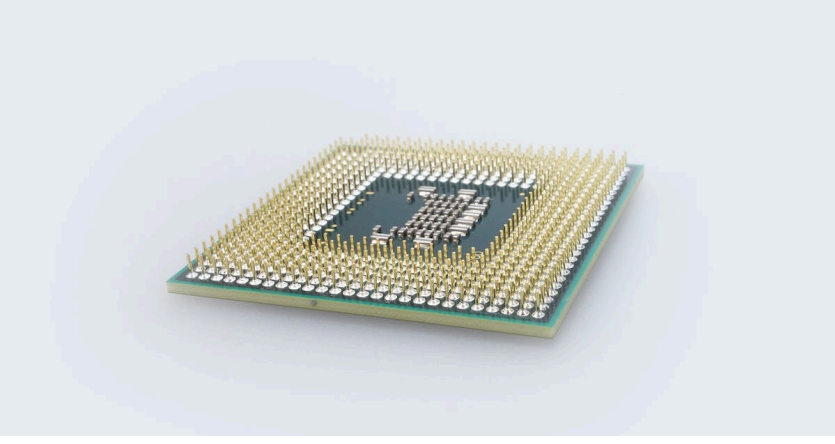


```
0000000000000000 <main>:
   0:   55                      push   %rbp
   1:   48 89 e5                mov    %rsp,%rbp
   4:   31 c0                   xor    %eax,%eax
   6:   c7 45 fc 00 00 00 00    movl   $0x0,-0x4(%rbp)
   d:   c7 45 f8 03 00 00 00    movl   $0x3,-0x8(%rbp)
  14:   48 c7 45 f0 04 00 00    movq   $0x4,-0x10(%rbp)
  1b:   00
  1c:   48 8d 4d f8             lea    -0x8(%rbp),%rcx
  20:   48 89 4d e8             mov    %rcx,-0x18(%rbp)
  24:   48 8d 4d f0             lea    -0x10(%rbp),%rcx
  28:   48 89 4d e0             mov    %rcx,-0x20(%rbp)
  2c:   48 8b 4d e8             mov    -0x18(%rbp),%rcx
  30:   48 63 09                movslq (%rcx),%rcx
  33:   48 89 4d d8             mov    %rcx,-0x28(%rbp)
  37:   48 8b 4d e0             mov    -0x20(%rbp),%rcx
  3b:   48 8b 09                mov    (%rcx),%rcx
  3e:   89 4d d4                mov    %ecx,-0x2c(%rbp)
  41:   5d                      pop    %rbp
  42:   c3                      retq
```

```
void swap(int *a, int *b) {
    int tmp = *a;
    *a = *b;
    *b = tmp;
}
```

Where are we going?

Along the way:

- Interact with the terminal and SSH
- Learn basic command-line tools and editors
- Access command-line documentation
- Practice C and using the C standard library
- Discuss related security and social topics
- Think about the next steps of Generative AI

Things to know about CSO1

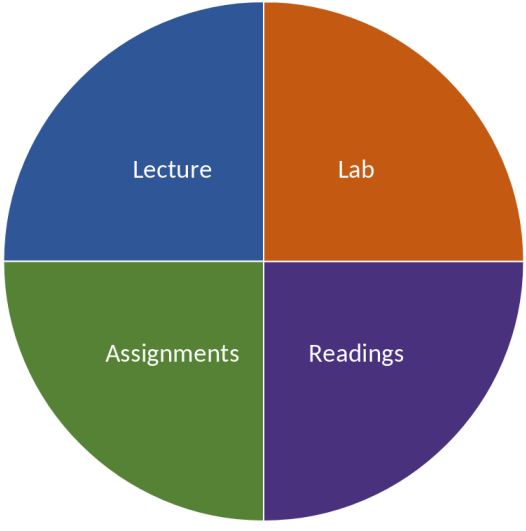
- This is a difficult course
- Why?
  - It's unfamiliar, not like CS 111x or CS 2100
  - It's more low-level
- But it's cool! How do computers work?
- We can then know how best to program and use them!

Who should take this course?

Preqrequisites

- You have credit (or passed the placement test) for at least one of CS 1110, CS 1111, CS 1112, CS 1113, or CS 1120
- You do not have credit for CS 2110 or CS 2150
- You will know some C- or Java-like language by the middle of the class
  - See website for examples we expect you to know

Course Content and Learning Sources



Course Content

Where do I go to find course material?
Canvas: central hub (i.e., glue) for 2130 this semester

- **Course website** for all content, assignments, lectures
- Lecture recordings on **Panopto**
- Q&A discussion on **Piazza**
- Submit assignments through **Gradescope**

Textbooks and Readings

Readings provided on course website

- Other links as provided

There is no required textbook. Our goal is to provide additional freely available material throughout the semester.

Optional: *Introduction to Computer Systems: From Bits and Gates to C/C++ & Beyond* by Patt and Patel

Expectations and Evaluations

Course Engagement

- Complete readings **before** coming to class
- Come to lecture and be present
- Participate in lab
- Practice lecture material through class activities, homework, lab
- Track progress on Quizzes and Exams
- Thoughtfully consider when to–and **not to**–use Generative AI

Measuring Learning

Four avenues to practice and measure learning

- Weekly Quizzes: Build on understanding from lecture and readings, think critically about difficult topics
- Lab: Practice course topics, learn supplemental topics to lecture
- Homework Assignments: Independent practice of course content
- Exams: Two midterms and final exam, in class

All are **individual** assignments except lab (unless otherwise noted)

Measuring Learning: Details

Weekly Quizzes

- Open Friday after class, due Sunday night by 11:59pm
- Independent, but open notes
- Lowest quiz score will be dropped
- *GenAI is allowed on quizzes, but we expect you to think about the material!*

Measuring Learning: Details

Labs

- We expect everyone to participate fully in lab activities
- Learning exercises in groups
- Most credit for participation, milestones for full credit
- One lab will be excused, but must be checked off for credit
- See syllabus for full details!
- *GenAI is NOT allowed by default in Lab! We want you to get some guided practice here.*

Measuring Learning: Details

Homework

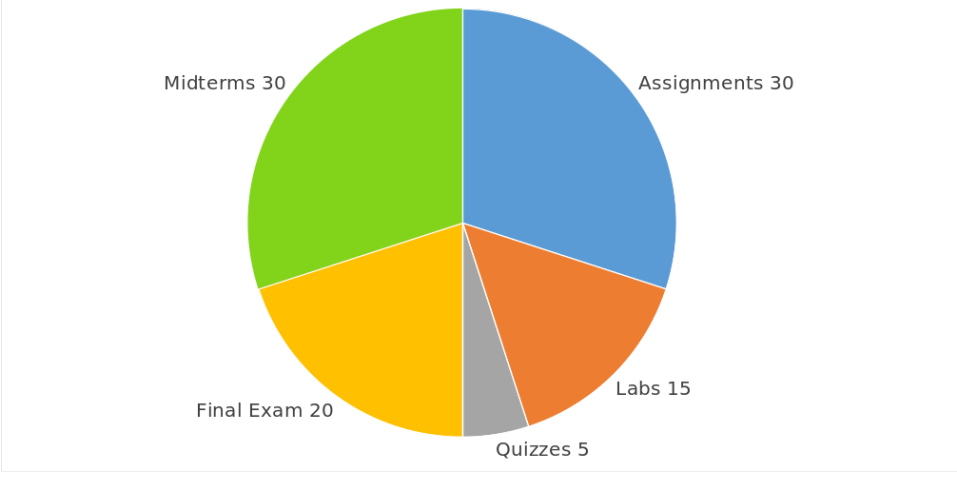
- Programming assignments, puzzles, worksheets, or other activities
- **Individual** assignments unless otherwise stated
- May be submitted up to 48 hours late with permission
  - Requests must be submitted in advance (see the syllabus)
  - Use your time wisely!
- *GenAI is NOT allowed to solve Homework assignments! You may use them for guidance, but not to write your solution.*

Measuring Learning: Details

Exams

- In-class, closed notes, likely pen/paper
- Two midterms: Oct 3, Nov 7
- Final Exam: Dec 12, 7-10pm
- *GenAI, smart glasses, smart watches, phones, computers, etc, are not allowed!*
- Best way to prepare is to practice by doing assignments, not using ChatGPT!

Measuring Learning: Grading



See the syllabus for full details and grading scale.

Professionalism, Academic Integrity

Honesty

- No plagiarism: cite any and every source you consult (even GenAI)
- **Write your own code**: Compose it yourself
  - Programming to help learn the content and demonstrate knowledge
  - Unlike industry, in which programming to create product
  - We are looking to cultivate our minds

Professionalism, Academic Integrity

Honesty

- Working with others is not okay (by default)
- Asking Generative AI to solve your assignments is not okay (by default)
- Do **not** share your code (even if you are just trying to help)

Consequences of dishonesty are outlined in our Syllabus

Generative AI / LLMs

LLMs are great! Generative AI is the future! But...

- Expert generative AI use requires expertise
- We need the background knowledge to guide our use of Gen AI

Guidance for this class

- **Do NOT use it** to solve homework or generate answers
  - The problem-solving struggle *is* a good struggle for learning
- **Do use it** for context, extra practice problems, cleaning up grammar, wordsmithing your (own) answers

Expectations and Evaluations

Illness Policies

- Attendance is **not** required in lecture, but course engagement is!
  - Watch lecture videos
  - Discuss on Piazza
  - Practice in Lab
- If you don't feel well, stay home, it will be okay
  - Will work with you–if you stay home–to ensure no effect to grade
- Masks are always welcome in class

Editors

Editors and Writing Code

- Familiarity with the command line **is a goal of this course**
- Setup and practice in Lab 1 and future labs
- You may **not** use online compilers or editors
  - Using an online compiler will result in a 0 on that assignment
- We will **not** be using VSCode until later
- We will ask you to run your code on the CS portal

This is a Large Class

How can you get your questions answered?

- Piazza (!!)
  - If you know an answer to someone else's question, answer it!
  - We're in it together for the next semester
  - But remember: do NOT share code or solutions
- TAs (office hours and labs)
- My office hours

This is a Large Class

How can you get your questions answered?

- Course email: cs2130@cshelpdesk.atlassian.net
  - Instructors and senior course staff
  - Likely fastest response for direct/personal issues
- My email: jh2jf@virginia.edu
  - Include "CSO1" in the subject
  - Response within a few days

Professor Hott - Who am I? Why teach 2130?

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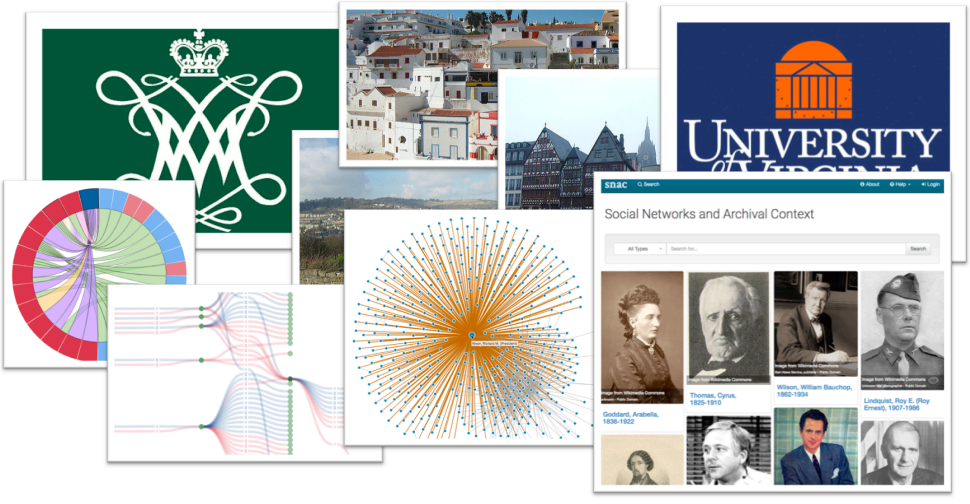

Questions?

Ask me *almost* anything