Course Introduction

CS 2130: Computer Systems and Organization 1

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Announcements

- Lab 1 tomorrow (Getting started with SSH)
- If you need to switch labs:
  - Form will be coming soon
  - Must be justified (i.e. class conflicts)
  - Very limited space to make swaps

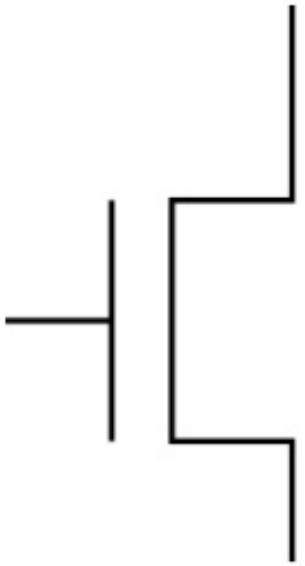
Today's Plan

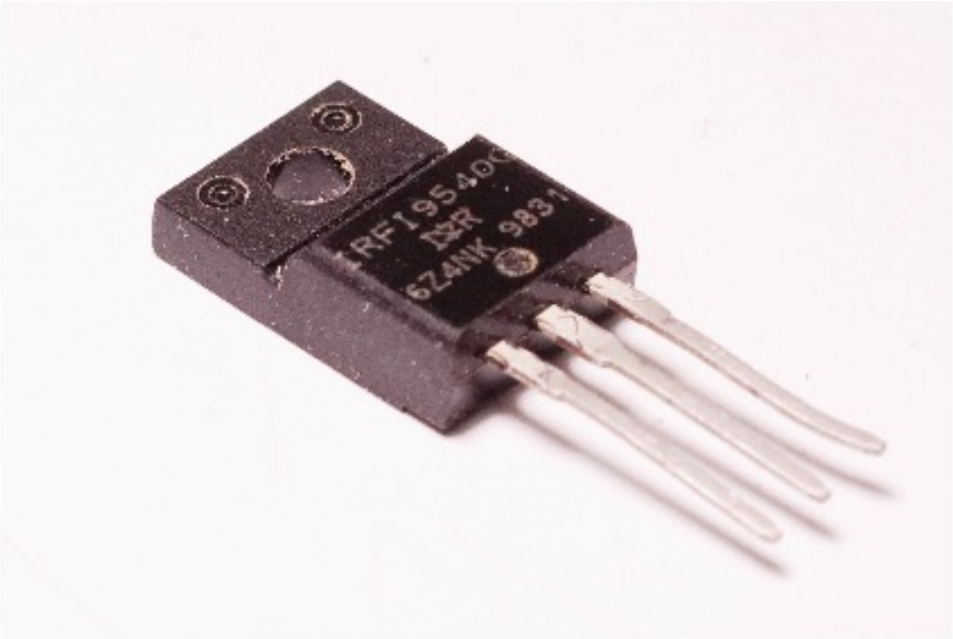
- Why CS 2130? What is CS 2130? Where are we going?
- Your Instructor
- Things to know about CSO1

Course Description

- **Why CS 2130?**
- **What is CS 2130?**

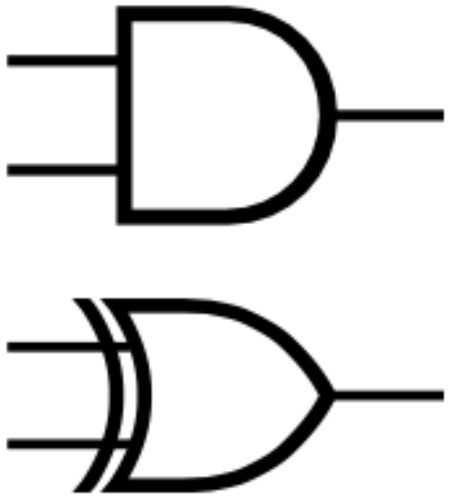
Where are we going?





0 and 1

Where are we going?



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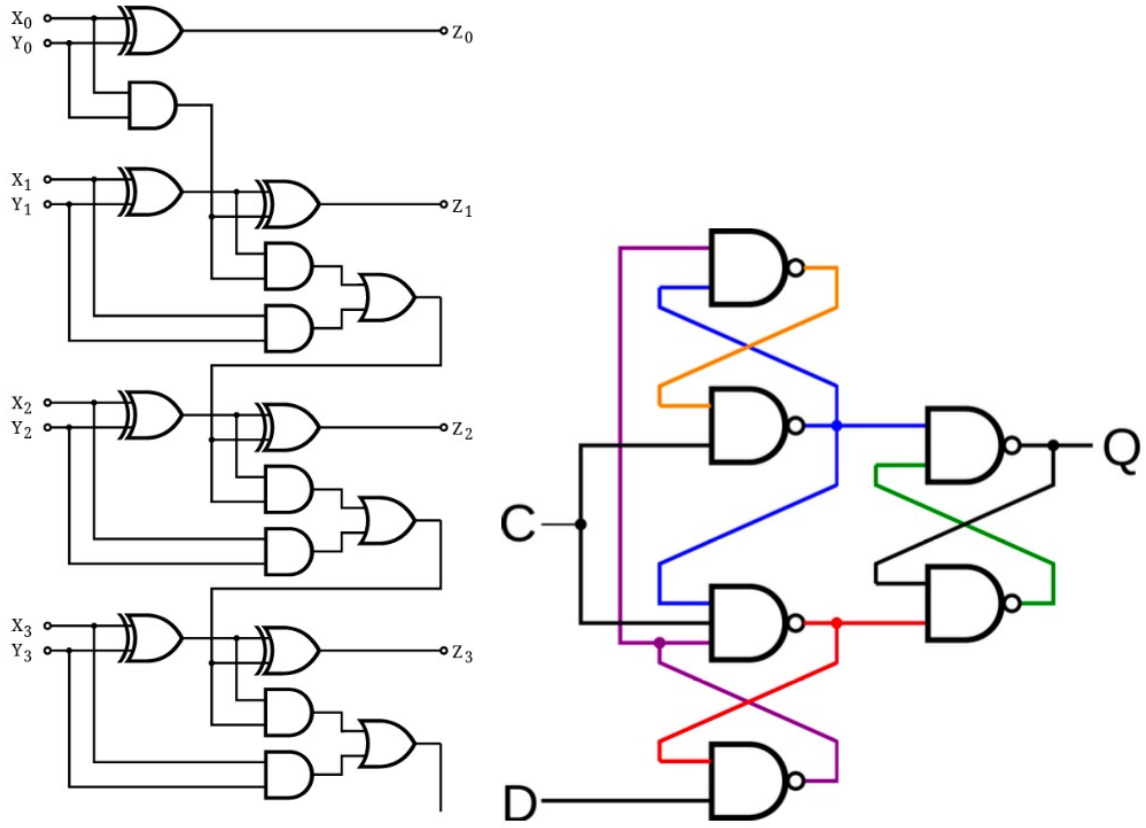

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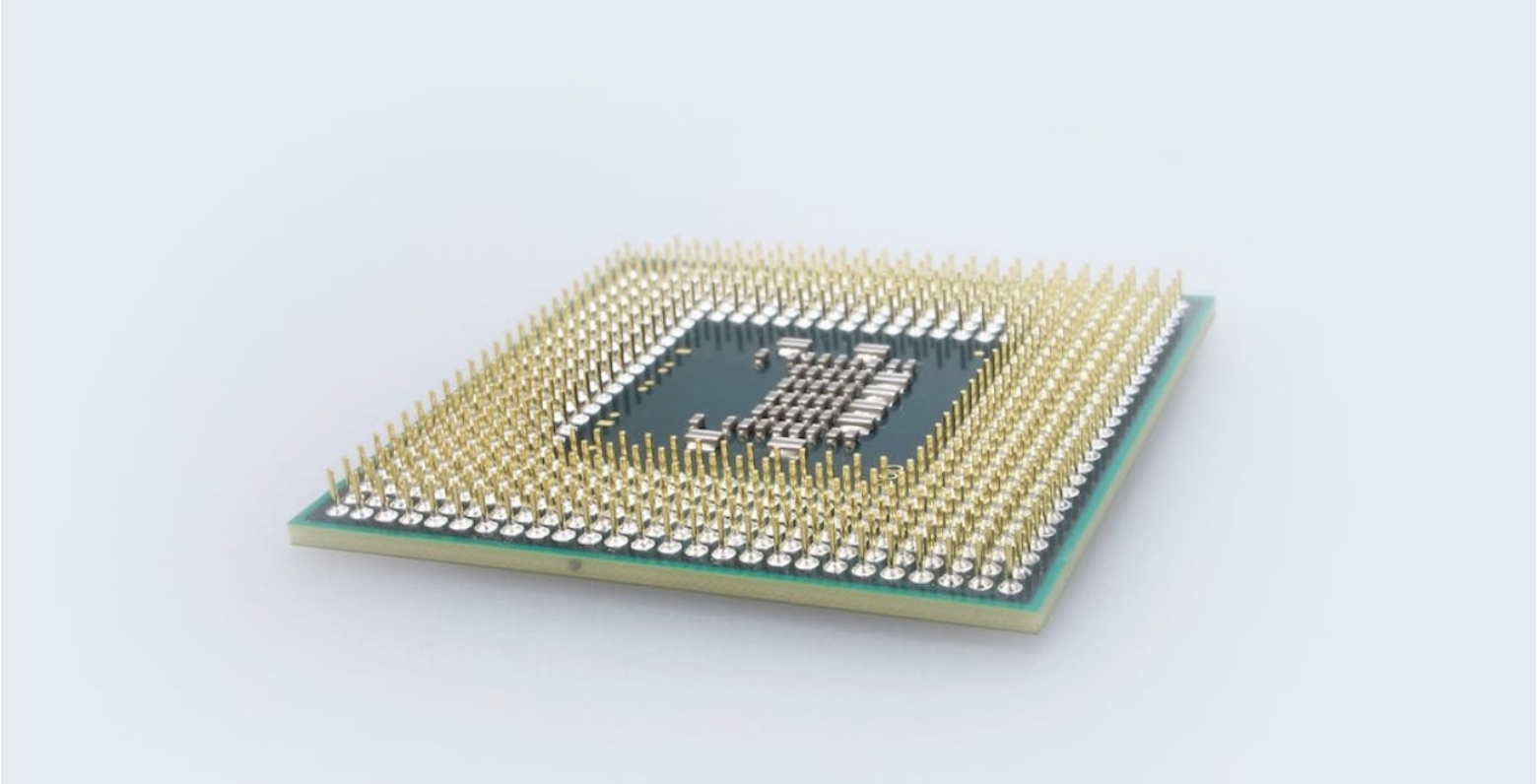


Where are we going?

```
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
```

Where are we going?

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

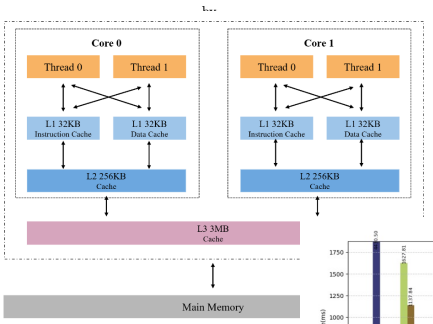
Where are we going?

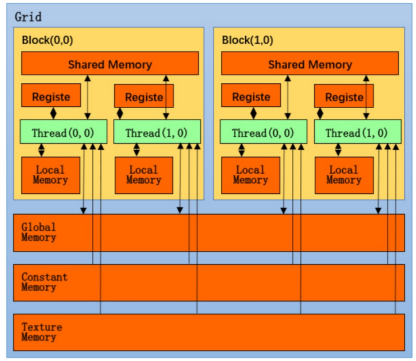
Along the way:

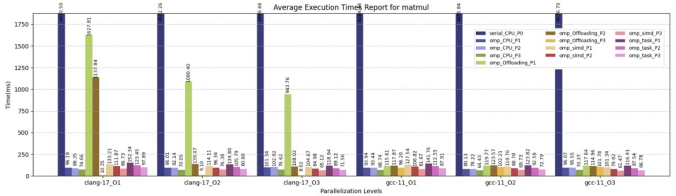
- Interact with the terminal and SSH
- Learn basic command-line tools and editors
- Access command-line documentation
- Practice C and using the C standard library
- Discuss related security and social topics

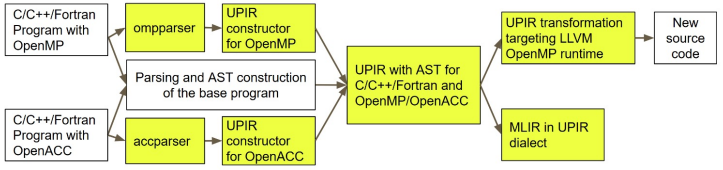
About Your Instructor – Xinyao Yi

ADVANCING PARALLEL COMPUTING BENCHMARKING: MULTI-LEVEL AND PROGRESSIVE PERFORMANCE ANALYSIS, OPTIMIZATION AND LEARNING SUPPORT FOR PARALLEL PROGRAMMING









Things to know about CS01 - This is a difficult course

Why?

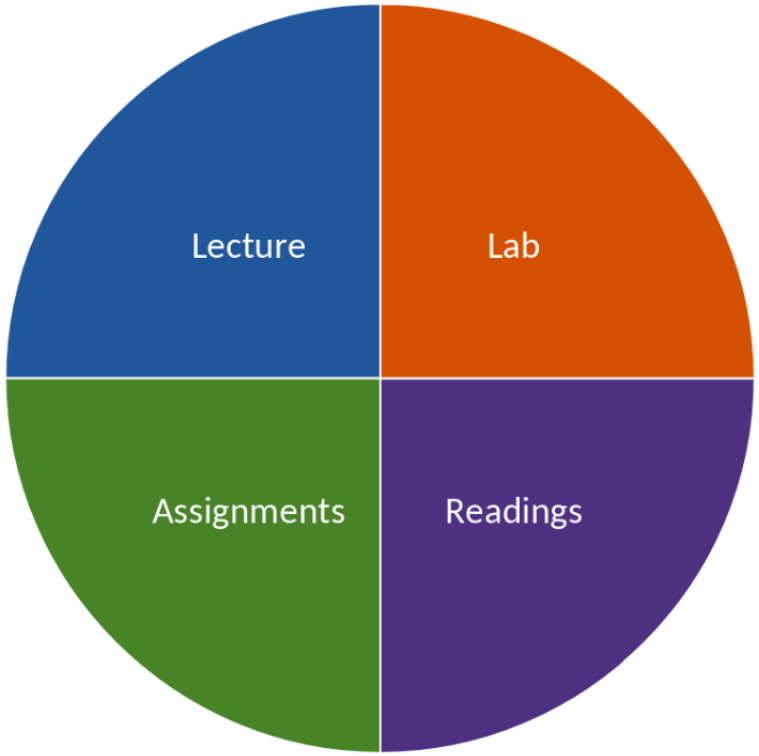
- It's unfamiliar, not like CS 111x or CS 2100
- It's more low-level
  - But it's cool! How do computers work?
  - We can then know how best to program and use them!

Things to know about CS01 - Who should take this course?

Prerequisites

- 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

Things to know about CS01 - Course Content and Learning Sources



Things to know about CS01 – 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**

Things to know about CS01 – Textbook 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

Things to know about CS01 – 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 Homework and Exams
- Thoughtfully consider when to–and not to–use Generative AI

Things to know about CS01 – Measuring Learning

Three avenues to practice and measure learning

- 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)

Things to know about CS01 – Measuring Learning

Labs

- We expect everyone to participate fully in **group** lab activities
- TAs will assess participation and progress of group
- Missing labs
  - Excused absences, check off individually by Sunday for up to full credit
  - Unexcused absences (max 2), check off individually by Friday for up to half credit
- See syllabus for full details!
- GenAI is NOT allowed by default in Lab! We want you to get some guided practice here.

Things to know about CS01 – Measuring Learning

Homework

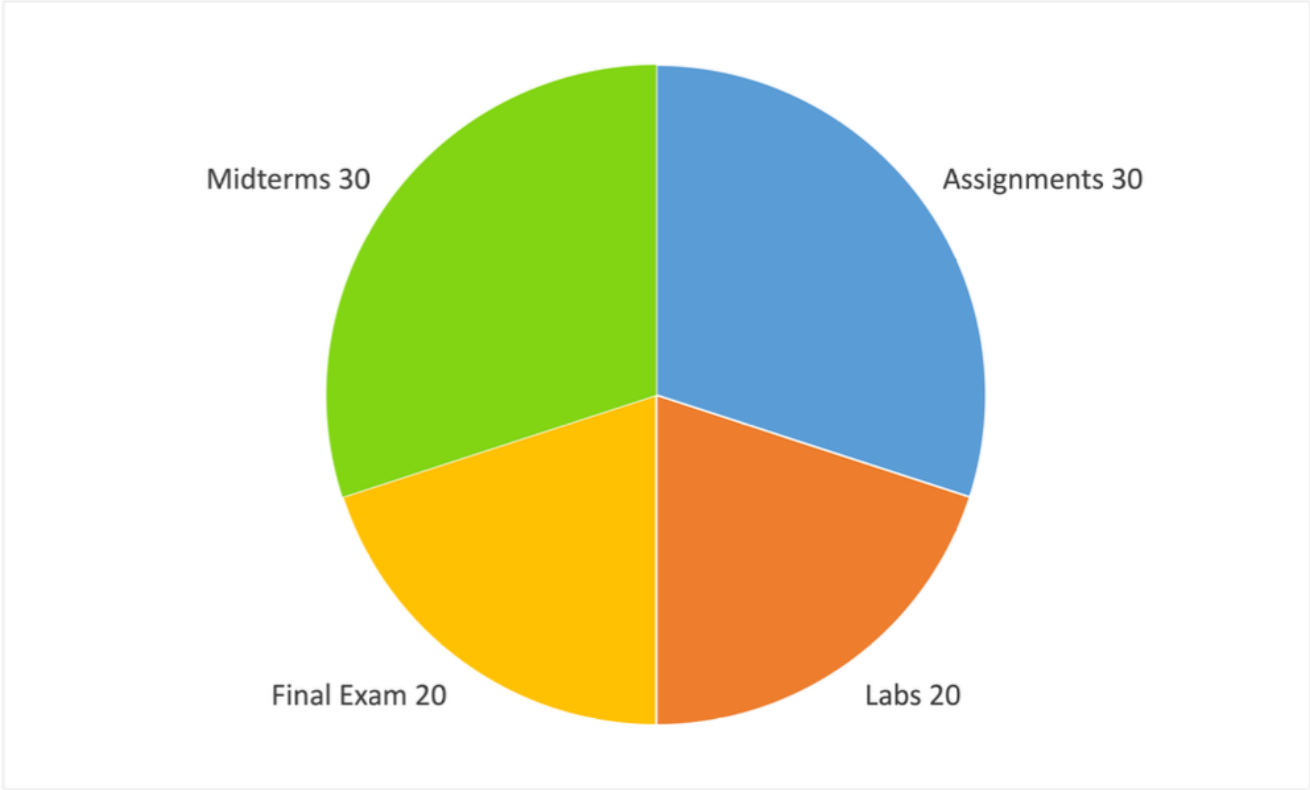
- Programming assignments, puzzles, worksheets, or other activities
- **Individual** assignments unless otherwise stated
- May be submitted up to 48 hours late (with extension request form)
  - Requests must be submitted in advance (see the syllabus)
  - Use your time wisely!
- GenAI is NOT allowed to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

Things to know about CS01 – Measuring Learning

Exams

- In-class, closed notes, pen/paper
- Two midterms: February 20 and April 3
- Final Exam: May 1(7 – 10 pm)
- GenAI, smart glasses, smart watches, phones, computers, etc, are not allowed! Best way to prepare is to practice by doing assignments, not using ChatGPT!

Things to know about CS01 – Grading



Things to know about CS01 – 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

Things to know about CS01 – Professionalism, Academic Integrity

- Working with others on assignments outside of lab 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

Things to know about CS01 – AI Tools

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

Things to know about CS01 – 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

Things to know about CS01

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

Things to know about CS01

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: mrq9gz@virginia.edu
  - Include ”CSO1” in the subject
  - Response within a few days

Any Questions?