

# cs5460/6460 Operating Systems

Lecture 00 – Logistics  
Anton Burtsev

# Welcome to cs5460/6460

- Mixed undergrad/grad class
  - 107 students
- Instructor: Anton Burtsev
  - <https://mars-research.github.io/aburtsev/>
- Class web page:
  - <https://mars-research.github.io/cs5460/>

# Short intro

- I build operating systems
- Clean slate
  - Atmosphere: formally verified microkernel in Rust
    - <https://mars-research.github.io/projects/atmo/>
  - RedLeaf: language safety of Rust for isolation
    - <https://mars-research.github.io/projects/redleaf/>
- Extensions to Linux
  - LXD/LVD/Ksplit: isolation of device drivers in the Linux kernel
    - <https://mars-research.github.io/projects/ksplit/>
- Extensions to Xen
  - XenTT: deterministic replay of virtual machines

# This course

- Inspired by
  - MIT 6.828: Operating System Engineering
  - <https://pdos.csail.mit.edu/6.828/2018/>
- Adapted for undergraduate students
- We will use xv6
  - Relatively simple OS kernel (only 9K lines of code)
  - Reasonably complete UNIX kernel
  - Started at MIT <https://pdos.csail.mit.edu/6.1810/2025/xv6.html>

# This course

- MIT moved to the RISC-V-based class
- We will use x86-64 bit version
- xv6 comes with a book
  - <https://xv6-64.gitlab.io/xv6-64-book/xv6-64-book.pdf>
- Another book we're going to use:
  - “Operating Systems: Three Easy Pieces” (OSTEP) Remzi H. Arpaci-Dusseau and Andrea C. Arpaci-Dusseau
  - Free online version <http://pages.cs.wisc.edu/~remzi/OSTEP/>

# Course organization

- Live lectures
  - High level concepts and abstractions
  - Recorded
- Reading
  - Xv6 book + source code
  - Bits of OSTEP book
  - Other materials
- Homeworks
  - Coding real parts of the xv6 kernel
- Weekly quizzes
  - Help to keep on track

# Grading

- Your grade
  - Homework: 30%
  - In-class activities: 10%
  - Weekly quizzes 15%
  - Midterm exam: 20%
  - Final exam: 25%
- You can submit late homework 3 days after the deadline for 60% of your grade

# More details

- 5-6 homework assignments
  - Build a shell
  - Build an ELF loader
  - Setup QEMU debugging environment and boot into “hello world”
  - Implement new system calls in xv6
  - Implement changes to the xv6 file system, maybe threading
- A weekly quiz
  - Assigned on Friday, due Monday
- In class PollEV

# Exams

- Exams are on paper
  - Open book (you can print anything you like)
  - Closed computers

# Plagiarism

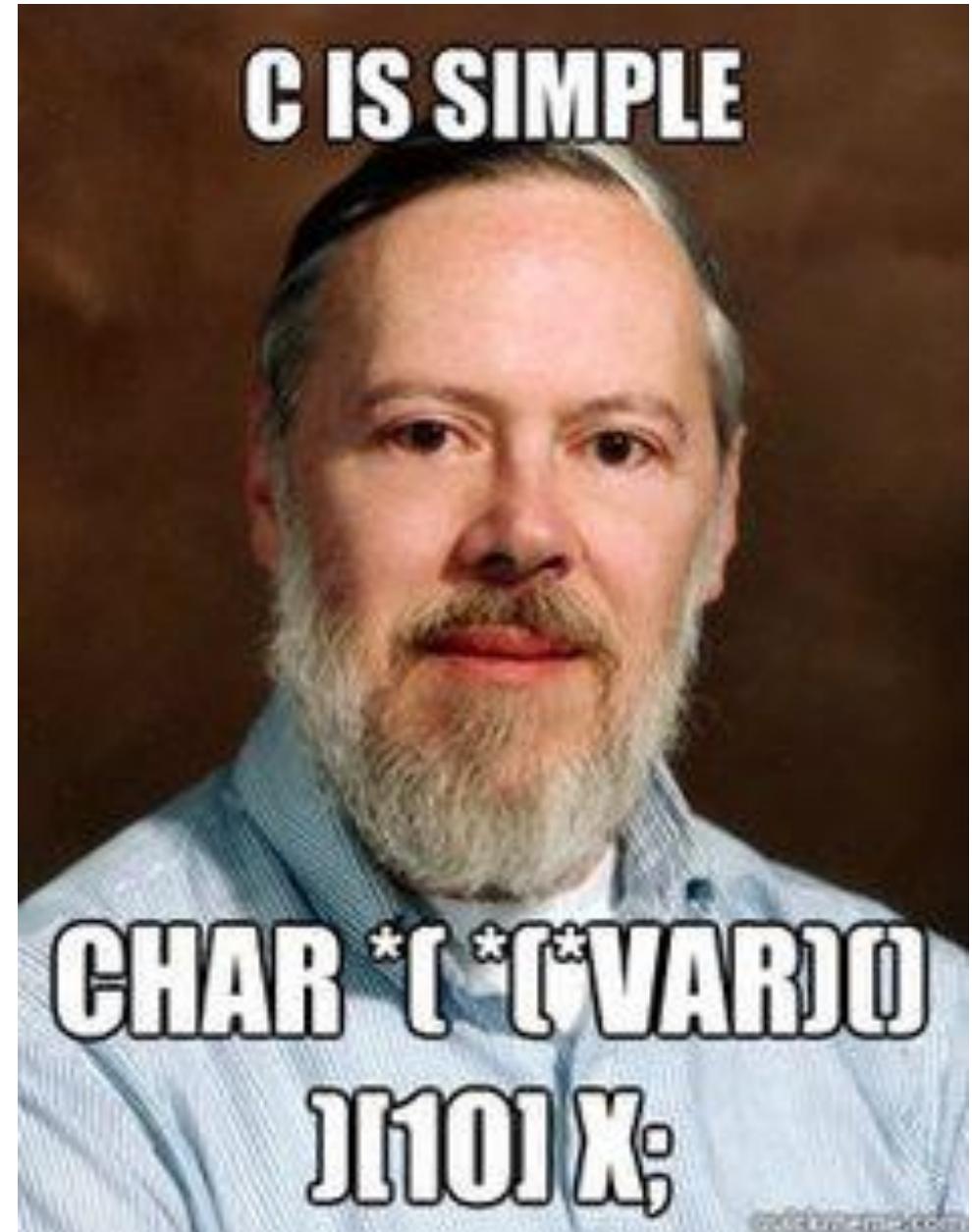
- All work should be your own
  - You can discuss approaches to any assignments
  - Ask questions on Piazza

# AI Use

- This year we plan on using Codex + VS code
  - Students are using AI anyway...
  - We are trying to find a creative way of letting you to use it

# Prerequisites

- Solid C coding skills
  - Xv6 is written in C
  - You need to read, code, and debug
  - AI can help explaining the code but still
- All homeworks are in C
  - Many questions will require explaining xv6 code
- Be able to work and code in Linux/UNIX
- Some assembly skills



# How to succeed?

- Read the source
  - This is the ultimate skill of any systems researcher

# How to succeed (continued)?

- Don't get scared
  - The class is hard
  - The goal is to teach you how real OS works, and it's non-trivial
- Homework assignments and exams are challenging
  - AI helps for homeworks but don't overdo it
  - Exams will require in-depth understanding of all homework assignments

Thank you!



Hey, you can't use AI on the  
exam

I don't even have a  
screen