

cs5460/6460: Operating Systems

Lecture 0: Class Logistics

Anton Burtsev
Spring 2025

Class details

- Mixed undergraduate and graduate
 - 137 students
- Instructor: Anton Burtsev
- Web page
 - <http://www.cs.utah.edu/~aburtsev/5460/>

Who am I?

- I build operating systems (since 2000)
- Bits of
 - L4 microkernel, micro-ITRON
 - Xen hypervisor deterministic replay infrastructure
 - RedLeaf
 - Rust for lightweight isolation
 - Atmosphere
 - Formal correctness
- www.cs.utah.edu/~aburtsev/

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
 - <https://pdos.csail.mit.edu/6.828/2018/xv6.html>
- xv6 comes with a book
 - <https://pdos.csail.mit.edu/6.828/2018/xv6/book-rev11.pdf>
- And source code printout
 - <https://pdos.csail.mit.edu/6.828/2018/xv6/xv6-rev11.pdf>

Course organization

- Live lectures (recorded)
 - High level concepts and abstractions
 - You have to watch them before coming to discussion sessions
- Reading
 - Xv6 book + source code
 - Bits of OSTEP book
- Homeworks
 - Coding real parts of the xv6 kernel
- Design riddles
 - Understanding design tradeoffs, explaining parts of xv6

Another Book

“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/>

Grading

- Grades are curved
 - Homework: 40%, in-class activities: 10%, quizzes 15%, midterm exam: 15%, final exam: 20% of your grade (all grades curved).
 - You can submit late homework 3 days after the deadline for 60% of your grade
- Small online quiz every week about the lectures
 - On Gradescope
- In-class activities to check participation
- Midterm
- Final

More details

- 5-6 homework assignments
 - Several small ones (designed to help you)
 - Create a simple Makefile, simple UNIX programs
 - Become familiar with GDB
 - Learn what's inside the program (how it gets linked and loaded)
 - Several big ones
 - Implement a shell
 - Boot into “hello world”
 - Load a user process

No homework first week!

Plagiarism

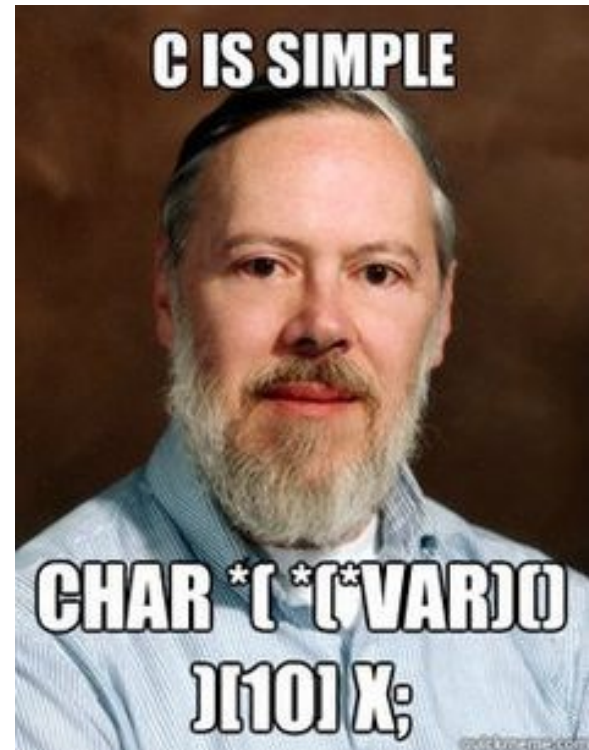
- All work should be your own
 - You can discuss approaches to any assignments
 - Ask questions on Piazza

AI use policy

- AI can be used for any of the assignments
- However, you should explicitly disclose it
 - Provide prompt details
 - Explain your approach for getting the answer

Prerequisites

- Solid C coding skills
 - Xv6 is written in C
 - You need to read, code, and debug
 - 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

How to succeed (2)?

- Don't get scared
 - The class is hard
 - The goal is to teach you how real OS works, and it's non-trivial
 - Homeworks and exams are challenging
 - We're very generous graders

Thank you!
Questions on Piazza!