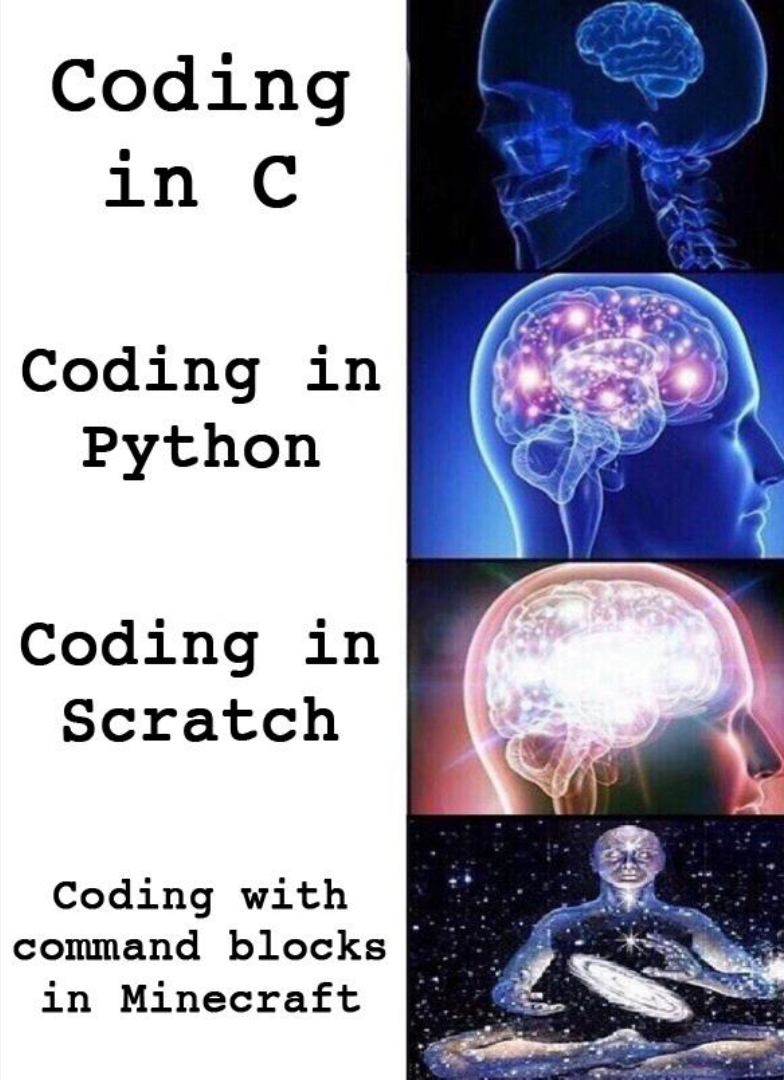
CSc 352
First Day of Class

Benjamin Dicken



Welcome to CSc 352

Systems Programming and UNIX

C Topics

- General C syntax / language (types, loops, ifs, functions, etc)
- The stack and the heap
- Memory management, malloc, free
- File I/O
- Implementing data structures
- How to debug programs with **GDB**
- How to check for memory leaks with **Valgrind**
- Build management with **Make**

UNIX / bash topics

- Files and the file system
- Processes
- General BASH usage (BASH = “Bourne Again SHell”)
- Text processing, regex
- BASH Scripting

Be Prepared

- This is not an easy class
- Be prepared to spend a lot of time, especially on the PAs
- The C stuff will be important to learn for the systems 400-level upper divisions
  - 422, 452, 453, etc
- The bash/ unix stuff should be generally valuable for your School *and* professional career

The Instructor

- Benjamin Dicken (Instructor of record)
  - Office: Gould-Simpson 850
  - Email: bddicken@email.arizona.edu
  - Office Hours
    - See the class website
    - Or by appointment

The TAs

- Mahdi Rahimi, marahimi@email.arizona.edu
- Deep Ruparel, deepruparel@email.arizona.edu
- Kartikey Shukla, kartikeyshukla@email.arizona.edu

What does it do?

```c
#include <stdio.h>
#include <stdlib.h>

int main() {
  int x1 = rand() + 100;
  int x2 = 50;
  if (x1 > x2) {
    printf("Greater!\n");
  } else {
    printf("Less or equal!\n");
  }
  return 0;
}
```

General Info

- Prerequisites: CS 210 and 252
- The 252 prerequisite is still lenient this semester
- Anyone in the course *not* have 252?

Class Website

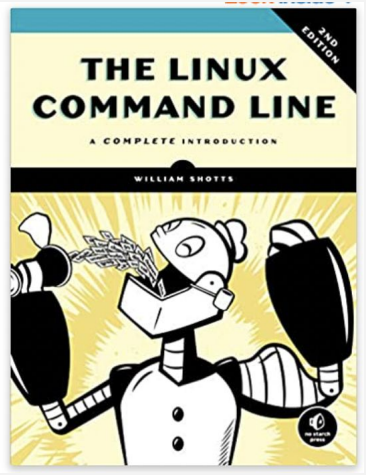
http://benjdd.com/courses/cs352/spring-2022/

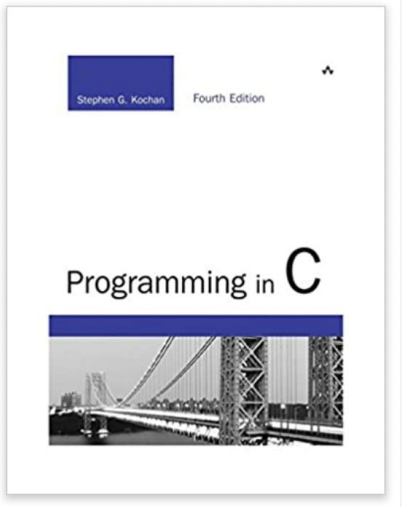
Textbooks

- The Linux Command Line, Shotts (2th)
  - https://www.amazon.com/dp/1593279523/

- Programming in C, Kochan (4th)
  - https://www.amazon.com/dp/0321776410/

- Required readings
- Exams will be open-book for these two books (hard-copy only)





What contributes to your grade?

- Exams
- Programming Assignments (PAs)
- Pop Quizzes

Activity

How much is each component worth?

Look it up in the syllabus

- Exams
- Programming Assignments (PAs)
- Pop Quizzes

How much is each component worth?

Look it up in the syllabus

- Exams 50%
- Programming Assignments (PAs) 40%
- Pop Quizzes 10%

Exams

- **3 Total**
- First three worth 15% each (both parts combined)
  - Open book (only for the two official textbooks, hard copy)
- Final exam worth 20%
- See course schedule for days

Programming Assignments (PAs)

- There will be approximately 11 PAs
- Turn in via gradescope
- Compile and run on Lectura
- Will talk more about assignment compiling / testing later

Pop Quizzes

- 10-15 pop quizzes
- Can be on the readings, material from class, PA content
- To account for sickness / missed classes, lowest 3 will be dropped

Grading Policy

- ***Our goal***
  - We will do our best to return grades to you within 1 week of the LATE deadline (so long as you turn it in on time)
- ***If you don't like your grade***
  - You have 5 days from the time your grade is returned to you on Gradescope/D2L/etc to request a regrade. After that, your grade is ***final***

How to get help?

- ***Ask a question via Email List***
  - Two lists, one for class-wide questions, one for instructors
  - Not going to use piazza
- **Visit office hours**
  - The TAs and Ben will have office hours, see course site
  - For TAs start TOMORROW
  - Some online

Academic Integrity

- When you are working on a solo PA, you ***can . . .***
  - Talk about ideas and techniques for solving the problem
  - Discuss the spec
  - Talk about the programming at a high-level
- But you may ***not . . .***
  - Share code with each-other
  - Look at eachothers code
  - Work on the project together, submit same code
- See syllabus, and this

Readings

- There will be prep work (typically reading from the textbook) due before each class
- Technically, you *can* get away without doing the readings, but would not recommend

Reading

Go to the class website, and figure out what readings are due for both **TODAY** and **next Wednesday**

Sites and Tools

- Sites:
  - Course website - Schedule, Syllabus, Office hour info, PAs
  - Gradescope - PA and Exam grading
  - D2L - Gradebook, (also will have slides, PA specs)
  - Zoom - Online Office hours
- Tools/software/hardware:
  - Access to Lectura :)

The first PA!

- Let’s go to class website

Lectura

- A server provided by the department
- Must connect and compile / run your programs from there
- Connect over the internet:
  - Mac / Linux: via **ssh**
  - Windows: via **putty**

Why lectura? C is not as universally compatible as languages such as Python and Java. A C program that compiles and runs fine on your computer may not on another.

Local and Lectura

- Can install gcc and run C programs locally
- Will need way to transfer to Lectura
  - Mac / Linux: scp
  - Windows: filezilla

Tasks to Complete ASAP

Get this done before next class!!!

Ensure your CS account is set up

If you've not done this before or have forgotten, go to:

https://helpdesk.cs.arizona.edu/

Ensure you can connect to lectura (ssh or Putty)

Do the readings from the TLCL, try out bash on lectura

OPTIONAL: try out bash on your own computer

(Windows: linux subsystem)

Lectura Connection Demo

Using Bash and SSH on a Mac

Using Shell / SSH / Putty on Windows

Running a few commands