CS50 Week 2

Connor Leggett
cjleggett@college.harvard.edu

Name Circle

- Name
- Year
- House/Dorm (if on campus)
- Favorite HUDS meal?

About This Section

- ~20 minutes of lecturing, ~40 minutes of practice problems, ~60 minutes of lab.
- Great place to ask conceptual questions!
- I'm your TF for the semester, so feel free to reach out with questions via email!
- If you're not officially in my section, but you want to be on my email list (for slides, surveys, etc) send me an email at cjleggett@college.harvard.edu
- Anonymous feedback/question form: https://**tinyurl.com/section-anon-form**

Questions?

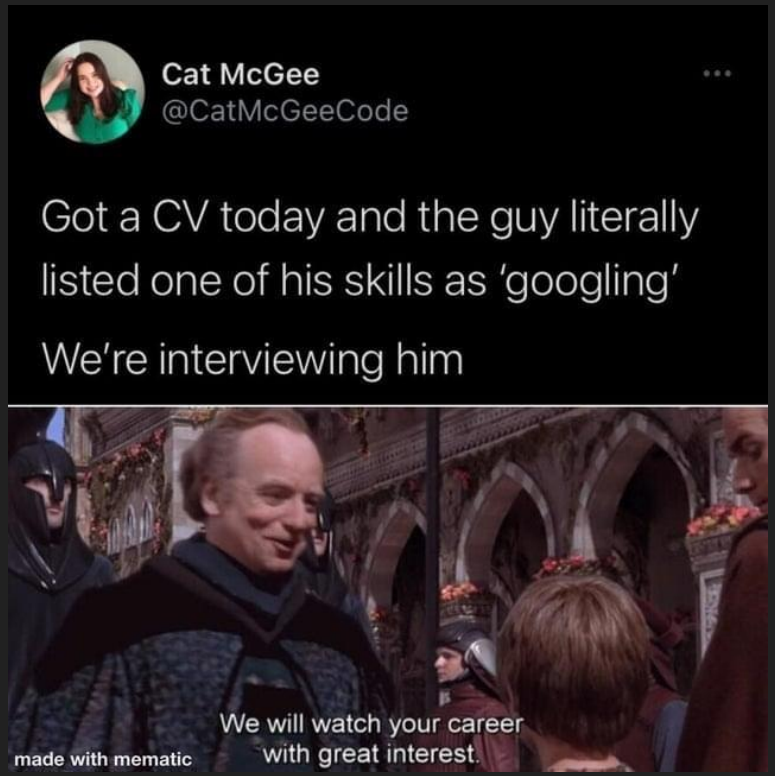
Weekly Schedule

- Lecture on **Monday**.
- Section on **Tuesday**.
- Quizzes due on **Tuesday** (@ noon)
- Labs due on **Thursday** (@midnight)
- Tutorials on **Wednesday – Sunday**.
- Office hours on **Sunday**. (3-5pm in Weidner)
- Problem set due on **Sunday** (@ midnight)

Questions?

Class Resources

- Shorts
- Lecture Notes
- Tutorials
- Office Hours
- Ed
- CS50 manual
- Walkthroughs
- Section
- check50, style50, help50
- heads@cs50.harvard.edu
- Late Days
- Syllabus
- Me!



Shorts

- Short videos explaining specific topics in more detail
- Available on the "week x" page on the website

Lecture Notes

- Detailed notes of what was said in lecture
- Available on "week x" page on website
- Hack: if you change the URL to 2021/spring, you can see lecture notes before they're released
- NOT A SUBSTITUTE FOR LECTURE!

Tutorials

- Great way to get questions answered
- 1:6 staff to student ratio
- Sign up >1 hour in advance at harvard.cs50.me
- You can go even if you don't have a specific problem!
- Please watch lecture + read through problem before coming.

Office Hours

- Once per week: 3-5pm Sundays at Weidner
- All (88) staff members walking around answering questions
- Can get a bit hectic

Ed

- Awesome resource for specific problems in code
- Pro tip: search for someone else who has already asked your question before asking it.
- Give as much info as you can
- If you include your code in the question, mark it as private.
- 3+ TFs and CAs monitoring Ed every day

CS50 Manual

- Good explanation of some C functions
- Mode for less comfy/more comfy
- available at https://manual.cs50.io/

Walkthroughs

- Great way to get a better understanding of a problem set
- Sometimes takes you through the pseudocode needed to get started.
- Available on the problem set pages

Section

- Tuesdays @9am in Science Center 110 if you want the best TF.
- If you can't make my section, you can go to any other section. Just make sure the other TF marks you as having attended.
- We'll do some review, some practice problems, and an ENTIRE lab

Check50, Style50, Help50, Debug50

- Check50: Some psets will allow you to check your input before submitting! This will be on the problem set page.
- Style50: running "style50 filename" will show you what style changes we need to make.
- Help50: running "help50 make hello" would give me better-explained error messages (sometimes)
- Debug50: running "debug50 ./mario" runs the mario code with the debugger

heads

- email heads@cs50.harvard.edu
- Great for:
  - Asking for an extension in extenuating circumstances (also contact resident dean)
  - Concerns about academic honesty
  - Saying you can't go to lecture this week
- Not great for:
  - specific problem set questions

Late Days

- You have one 72-hour extension to use at any point without any excuse
- Fill out the form here to use it: https://cs50.ly/extensions
- This does not mean three 24-hour extensions!
- Be careful about using this early
- ONLY FOR PROBLEM SETS!!!
- Otherwise: Lateness penalized at .1% per minute

Syllabus

- Everything you need to know about the class
- All deadlines
- Check here before asking logistical questions

Me!

- Email: cjleggett@college.harvard.edu
- Phone: (603) 387-4137
- Good things to reach out with:
  - Questions about grading
  - Questions about the course in general
  - Questions or concerns about school/personal life in general
- Notes:
  - 5+ people monitor Ed every day. 1 person monitors my email inbox.
  - I am sometimes doing non-cs50 things (sleeping, running, playing PES 2012 on the wii)
  - I am a "responsible employee"

Questions?

Grading

- Problem Sets: 40%
- Quizzes: 10%
- Labs: 10%
- Test: 20%
- Final Project: 10%
- Attendance: 10%

Problem Sets (40%)

- Due Sundays at midnight
- Extensive coding exercises
- Graded on:
  - Correctness: Does it work? (Aim for 5s on this)
  - Design: Is the code well-designed? (Aim for 3-4 on this, maybe some 5s)
  - Style: Is the code **understandable**? (Aim for 4s and 5s on this)
- Scale of 1-5
- Stress Level: 🙈🙈🙈🙈
- Fun Level: 🙈🙈🙈🙈

Quizzes (10%)

- Due Tuesdays at noon
- **Short** comprehension questions about lecture
- Keep your answers **short**
- I can't help you directly with these
- Scale of 0-3
- Stress Level: 🙈
- Fun Level: 🙈

Labs: 10%

- Due Thursdays at midnight
- We will start and finish labs in class!!!
- Help you get started on psets
- Stress Level:
- Fun Level: 🙈🙈🙈🙈🙈

Test (20%)

- You'll have 5 days to do this
- Can't ask for help from staff, Ed, or other students
- **Can** look up things on google
- Not for a suuuper long time
- Stress level: 🙈🙈🙈🙈🙈
- Fun Level: 🙈🙈

Final Project (10%)

- You get to choose what to do for this project
- You'll have time to do it and can ask for help
- Work in groups of 1-3
- Stress Level: 🙈🙈🙈
- Fun Level: 🙈🙈🙈🙈🙈

Attendance (10%)

- Must go to lecture or section
- If you can't go to section, find another section to go to for that week
- If you can't go to lecture, email heads@cs50.harvard.edu
- Stress Level: 🙈
- Fun Level: 🙈🙈🙈🙈

How do grades add up and transfer to letters?

idk

Questions?

Arrays

```
type name[size]
```

```
int scores[5]
```

Declaring and Initializing Arrays

Write some code that initializes an integer array of length 3, and allows a user to input 3 test scores.

```
int scores[3];

for (int i = 0; i < 3; i++)
{
    scores[i] = get_int("Score: ");
}
```

Strings

A string is just an array of characters

```
string s = "CS50";
```

s[0]

`s[1]`

ASCII

ASCII

- Ascii table: https://www.asciitable.com/
- Way to encode symbols as numbers
- How to get an ascii value from a char?
- How to get a char from an ascii value?
- Let's program in ascii.c

Command-Line Arguments

Old Main Function

```
int main(void)
{

    // Do some stuff here

}
```

Old Main Function

```
int main(int argc, string argv[])
{

    // Do some stuff here

}
```

Command-Line Arguments

- **argc**: number of command line arguments
- **argv**: array of command line arguments

```
int main(int argc, string argv[])
{

    printf(“There are %i command-line args\n”, argc);

    printf(“The first command line argument is %s\n”, argv[0]);

}
```


./caesar 2
argv[0]
argv[1]

Practice Problems

reverse.c

- Task: Write a program that takes in a string as input, and prints its reverse
- Expected behavior:
  ./reverse
  Text: Hi, I’m Connor!
  Reverse: !ronnoC m’I ,iH
- Work Setting: We’ll do this one as a class in CS50 IDE

addition.c

- Task: Write a program that adds two integers given as command line arguments.
- Expected Behavior:
  ./addition 4 5
  4 + 5 = 9
- Work setting: As a group on the board

Lab Time!

More Practice Problems!

palindrome.c

- Task: Write a program that takes in a string, and determines whether or not it is a palindrome
- Expected Behavior:
  ./palindrome
  Text: hello
  NOT A PALINDROME
  ./palindrome
  Text: racecar
  PALINDROME
- Work Setting: In pairs on ONE person’s laptop

initials.c

- Task: Write a program that takes in a full name, and displays initials.
- Expected Behavior:
  ./initials
  Name: Connor James Leggett
  CJL
- Work Setting: In same pairs, with the OTHER person typing

anagram.c

- Task: Write a program that takes in 2 words (all lowercase letters) and prints out whether or not they are anagrams of each other (being an anagram means that rearranging the letters of one can get you the other.
- Expected Behavior: Show in IDE
- Work Setting: In groups of 3-4 on the boards

Problem Set Preview

Readability:

- Take in a bit of text, and output the grade level for that text
- Be careful of when/where to round numbers!
- indexing into strings and using for loops is important here.

Caesar

- Implement a caesar-cipher
- https://computerscienced.co.uk/site/caesar-cipher/
- Be careful about capital vs. lowercase letters
- strings and for loops are very important
- Ascii is super important

Bonus Resource: These Slides and Exercises!

https://www.github.com/cjleggett/2021-section