

# 3827 OH

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Columbia University

February 1, 2022

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# Introductions

# Introductions: About Me

- My name is Eumin Hong (UNI: eh2890)
- I am a junior in Columbia College studying computer science
- I am from New York
- This is my fourth time TAing for 3827 (second time with Professor Rubenstein)
- I took this course with Professor Kim in Fall 2020
  - Took 1004, 3134, 3251 before 3827; took 3827 concurrently with 3203
- Only need intro computer science course (how to code) and some high school math (mostly logic) to succeed

# Introductions: About You

- Please introduce yourself and mention
  - 1 Your name
  - 2 Year
  - 3 School
  - 4 Hometown
  - 5 Anything else that you would like to share

# Logistics

# Logistics: Course Grading

- Raw score  $S$  formula:

$$S = 0.1H + \max(0.3M + 0.6F, 0.45M + 0.45F)$$

where  $H$  is homework,  $M$  is midterm, and  $F$  is final

# Logistics: Homework

- Homework will be submitted via Gradescope (entry code: 6P28R7)
- Scored out of 3
- Relatively loose rubric – check solutions or ask in OH for more detailed explanations
- Extensions are handled by me (not Professor Rubenstein)
  - On the TA side, there is a spreadsheet with the latest possible submission date – I cannot give out extensions past this date unless there is an emergency (in which case
  - Please contact me in advance about extensions – psychologically, I prefer that you ask for an extension and not use it rather than have you ask me for an extension on the original due date
  - I will grant extensions (that come in advance) in general, possible reasons include a lot of work/stress, interviews, upcoming tests/exams/essays, etc.



# Logistics: P-credit

- P-credit is a way to boost your grade, scored out of 3
- Homeworks and exams count for less – see 3827\_Lecture\_00.pdf for figures
- Obtain maximum P-credit by attending OH, participating, etc.

# OH Logistics

# OH Logistics: Structure

- Attendance will be taken via Zoom (either chat or participant history)
- After covering announcements (upcoming homeworks, exams, etc.), it is whatever you would like to do
  - May have additional problems to highlight edge cases/tricks, or can end early
- Make use of this time and prepare your questions in advance – can be about previous/current homeworks, current course content, etc.

# Logistics: Switching OH Sections

- For both permanent and temporary switches
- For different TA section: email TA whose section you would like to switch to, and **CC me**
  - If you do not email any TA and attend other OH section, P-credit cannot be guaranteed
  - If you miss my OH for the week and want to attend other OH section, email me first (to acknowledge missing OH) and then email TA and CC me
    - No P-credit deduction for first couple times since stuff comes up
  - Email in advance
- For my other section: email me
  - To switch to my other section is not too big of an issue; I will probably be using the same Zoom link and the sections are back-to-back

# OH Logistics: OH Mode

- Either online or in-person
- Will definitely have OH in-person for MIPS (topic after the midterm)
- Pros and cons to either mode
- Will probably go with online OH for majority of semester for notes, convenience, and health
- OH will not be recorded, but blank slides will be on GitHub before each OH (ideally) and notes from OH will be on GitHub

# OH Logistics: Communication

- If you want to contact me directly, send an email to [eh2890@columbia.edu](mailto:eh2890@columbia.edu)
- Announcements will be via email
- Also open to a group messaging system for OH (will send announcements here as well if created)
  - Options include Slack, GroupMe, etc.
  - Will probably merge my OH sections

# OH Logistics: Feedback

- This semester, I will be trying anonymous feedback
- Form: <https://forms.gle/cnUmKVNYN7WvRbHA6>

# OH Logistics: Resources

- OH GitHub: [https://github.com/eh2890/CSEE\\_W3827\\_S2022](https://github.com/eh2890/CSEE_W3827_S2022)
  - Will have course lectures slides, OH slides, OH notes, etc. here
- All OH Sections: <http://uribe.cs.columbia.edu/sched/assigned-slotorder.html>
- My OH Sections:
  - Section #11: Tuesday 3pm
  - Section #10: Tuesday 4pm
- Course Google Calendar: [https://calendar.google.com/calendar/u/0/embed?src=16uc8kberc2b6dtltq6e49dv3k@group.calendar.google.com&ctz=America/New\\_York](https://calendar.google.com/calendar/u/0/embed?src=16uc8kberc2b6dtltq6e49dv3k@group.calendar.google.com&ctz=America/New_York)
  - Additional OH will be posted here and also announced



# Homework 1

# HW1: Problem 1

Assume an architecture where all numbers are to be represented using 8 bits. What are the (base 10) values of the 8-bit binary numbers when interpreted using (i) unsigned, (ii) signed magnitude, (iii) 1's complement, (iv) 2's complement form:

- (a) 00110011
- (b) 10000000
- (c) 11111111
- (d) 10011011
- (e) 10001010

# HW1: Problem 2

Convert the following (base 10) numbers to their binary representation using 8-bit (i) signed magnitude, (ii) 1's complement, (iii) 2's complement forms:

- a)  $-1$
- b)  $-15$
- c)  $-67$
- d)  $-127$

# HW1: Problem 3

For each pair of  $x$  and  $y$  below, convert  $x$  and  $y$  to their 8-bit 2's-complement forms, subtract  $y$  from  $x$  (so you need to negate  $y$  and then add). Indicate whether an overflow occurred (and show clearly how you know), and convert the solution back to base 10 (even when an overflow occurred and the solution is wrong, i.e., your answer should fit in the 8-bit representation of that form.).

- a)  $x = 10, y = -13$
- b)  $x = 117, y = 35$
- c)  $x = 117, y = -35$
- d)  $x = -117, y = 35$
- e)  $x = -117, y = 11$

# HW1: Problem 4

Given the bit pattern 1010 1101 0001 0000 0000 0000 0000 0010, what does it represent, assuming that it is

- ☐ a two's complement integer?
- ☐ an unsigned integer?
- ☐ a single precision (32-bit) floating-point number?

# HW1: Problem 5

Represent the following numbers, given here in binary form, as floating point numbers using IEEE 754 floating- point standard representation:

- (a) 11010.1110
- (b)  $-11011.10$
- (c) 0.000101
- (d)  $-1.010101$
- (e) 10000000010