

CS 70 Su23: Lecture 0

Introduction and course overview

Welcome to CS 70!

- This is a discrete math and probability class
 - for clarity, it's (discrete math) and (probability)
- Discrete math
 - There will be a lot of proofs
- Probability
 - There will be a lot of sets and counting
 - There will also be calculus (it's ok if you've forgotten it)
- “Math without numbers”

Who are we?

Nate (he/him)

- Just finished BA in Math, CS, Physics
- (Incoming) Grad student in Pure Math
 - Not here :(, in UK
- TAed CS 70 for five semesters (including one summer; also took in summer)



Who are we?

Nikki (she/her)

- Studying CS/DS/Math :))
- CS70 Head TA for 2 semesters, Data140 (Probability for Data Science) for 1 semester
- Teaching probability section of the class!



Who are we?

Victor (he/him)

- Grad student
 - BS in EECS in 2012
- Working full-time as an Engineering Manager at Everlaw
- TAed CS 70 for three summers
- Tenth(!) summer teaching CS 375!



Course expectations

- We assume you have taken 61A (or equivalent)
 - There's no coding in this class, but we will reference programming (python) a fair amount
- This is a 4-unit course
 - Campus guidelines says 3 hours a week per unit
 - but in the summer, everything is doubled because we have 8 weeks instead of 15
- **You should expect to spend 24 hours a week on CS 70**
 - We do *not* recommend taking any other technical courses over the summer
 - 6 hours will be spent in lecture, and 4 hours will be spent in discussion
 - You should plan to spend **3 hours a day** (weekdays only) on the problem sets

If you have other commitments that require more than 16 hours a week, please talk to us!

Course expectations

This course is intended to be taken synchronously, in-person

- If you have a choice, we highly recommend doing things in-person
- For those who must be remote, we will do our best
 - but the experience **will** be worse
- Remote exams will be proctored, and you will need to submit a recording of you taking the exam
- Remote discussion and office hours will have limited coverage

Some discussions happen before lecture

- You are expected to read the notes beforehand

Elephant in the room: grades

- Discussion Attendance: 5%
 - need to attend 13 throughout the summer
 - sign up for a discussion section if you haven't already!
- Vitamins: 5%
 - lowest two vitamins dropped
- Homework: 20%
 - lowest two homeworks dropped
- Quizzes: 30% (instead of a midterm)
 - lowest quiz dropped
- Final: 40%

Assignments

- Homework
 - Released **Monday**, due **Thursday** at 11:59pm
 - Grace period until **Friday**
- Vitamins
 - Released **Monday**, due **Thursday** at 11:59pm
 - Grace period until **Friday**
- Quizzes
 - Every other week (week 2, week 4, week 6)
- Final
 - Last week

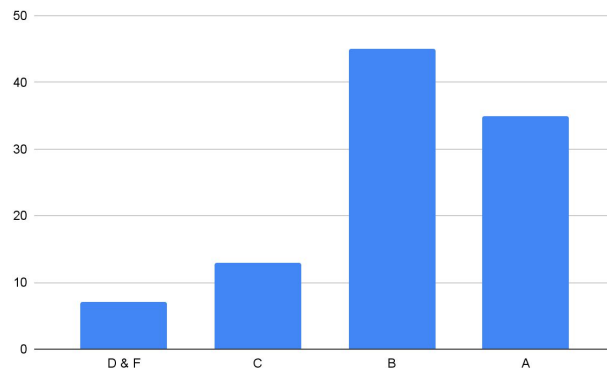
Grading

- This class is not curved
 - ...is what we'd like to say

“A typical GPA for a lower division course will fall in the range 2.8 - 3.3, depending on the course and the students who enroll.

For example, a GPA of 3.0 would result from:

- 35% A's
- 45% B's
- 13% C's
- 7% D's and F's”



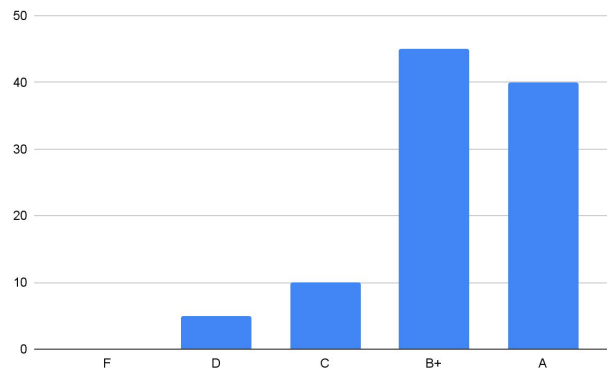
Grading

- This class is not curved
 - ...is what we'd like to say

“A typical GPA for a lower division course will fall in the range 2.8 - 3.3, depending on the course and the students who enroll.

... but what about a GPA of 3.3?

- 40% A's
- 45% B+'s
- 10% C's
- 5% D's and F's”



Grading

- This class is not curved
 - ...is what we'd like to say
- But we're also not doing a traditional curve
 - instead of fitting your scores, we fit our exams to the curve
- So concretely, what does this mean?
 - exams have been written with an expected average (mean) of 50%
 - this allows for better differentiation
 - if the mean is too high, there's no need to curve down
 - *getting 50% on an exam is not a failing grade!*

~~tldr: if your total score is around 50%, you're getting some flavor of B~~

- please see [clarification on this](#)

Code of conduct

- On everything except for exams, you are allowed infinite collaboration
 - cite your sources: denote who you worked with, and what resources you consulted outside of the lecture notes
 - no collaboration on quizzes or the final
- **You must always write up your own solutions**
- If you break the rules:
 - 1st offense: 0 on the assignment or exam
 - 2nd offense: 0 on the category (homework, quiz, final, etc)

Why CS 70?

- Programs are just math
 - This class hopes to provide the foundation upon which CS is built
 - But we don't teach this class first in the same way you want to learn the present before you learn the past (and future)
- Thinking rigorously and reasoning logically is a good way to live life
 - Hopefully, after this class, you will have more tools to convince yourself if something is true

Some tips

- **MAKE FRIENDS**

- Proofs is all about convincing others
- Be the “dumb” person in the room
- We will help here as much as we can

- This class takes time (sometimes, a *lot* of time)

- Repetition and practice is the only way to learn the material
- Read the notes **in addition** to lecture slides

- Reading math requires multiple tries

- If you read a paragraph and it doesn't make sense, read it again!
- Just like code, break things down line by line, sentence by sentence, to follow it
- Abstract as necessary

Some terminology

- “Formally”
 - Framing something in precise mathematical terms
 - Think of this as using “proofy” syntax, much like any programming language’s syntax
- “Intuitively”
 - A fancy way of saying “not mathy”
 - Think of this as “opposite of formally” (or a way to get partial credit if you’re stuck)
- Divides (“|”)
 - formally, if $a \mid b$, there exists some q such that $aq = b$ (and vice versa)
- Parity (even/odd)
 - if n is even, there exists some k such that $n = 2k$ (and vice versa)
 - if n is odd, there exists some k such that $n = 2k + 1$ (and vice versa)
 - a number cannot be both even and odd