CS 561, Lecture 0

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Today's Outline

- About Class
- Prereq Material

About Me

- Grew up in rural Georgia, USA; Lived in Palo Alto, Kyoto, and Seattle. Love to travel, hate pandemics.
- Work in theoretical computer science: provable security for distributed algorithms
- Graduated dozens of PhD students, many recruited from this class. They have found industry positions at Amazon, Facebook, Google, and postdocs/academic positions at Yale, U. Virginia, Drexel, MSU, Loughborough.
- Hearing: I am completely deaf in high frequency ranges
  - If I mishear you, please **rephrase** your question/comment.
  - I will not hear any high pitched alarm. I can't hear whispering.

About Class

- Topics covered: Randomized Algorithms and Data Structures; Induction and Recurrences; Dynamic Programming and Greedy Algorithms; Graph Algorithms; NP-Hardness and Approximation Algorithms; Linear Programming and Gradient Descent
- This class assume knowledge of proofs (direct proof, proof by induction, contradiction, case analysis), asymptotic notation and recurrence relations, basic algorithms (such as sorting and search) and data structures (such as binary trees).
- You are **wasting your time here** if you haven't had the prereq material. Like sitting in on a Japanese III class if you haven't taken Japanese I and II.

Math and Proofs

- Class uses a mathematical methodology (theorems and proofs)
- This class is challenging, especially if you haven't done proofs before.
- Best way to study is to **solve problems, and re-derive proofs**
- This mathematical methodology is an **extremely** important tool in computer science
- We'll mostly be covering material that has only been discovered in the last several decades - and near the end of the class, in the last decade. I'm an expert in this area, and even I get stuck and make mistakes.

Administrivia

- Web page
- Syllabus
- Piazza (todo: sign up)
- There will be a 1 hour quiz on Thursday. It will cover pre-req material including material in Pre-lecture 1 and 2, and Appendices of our textbook. It will help you determine if you're ready to take this class.

Homeworks

- You may work with others on hw problems, but **must write up solutions individually**. Wait at least 30 minutes after group discussions before writing up your solutions
- I will **not be** handing out solutions to problems. I am happy to help you if you are stuck via Piazza, office hours or lecture.
- *"The point of homework is not to solve that particular homework problem, but to practice solving a type of problem and get honest feedback on your progress. I've found that when solutions are available, my own students are much more likely to rely on them, rather than trying to figure out the problems themselves, which means they get both less practice and less honest feedback, which means they do worse on exams and in the course overall. And while I firmly believe that each student is ultimately responsible for their own learning, I also believe that it's my responsibility as an instructor to help them. Putting dessert on the table does not help anyone eat their vegetables. - Jeff Erickson"*

Todo

- Sign up for Piazza; review syllabus
- Study for Thursday quiz: Review Pre-req slides and Appendices carefully, solve problems.

This Week's Outline

- Pre-Req Material Lightening Review
- Randomized Algorithms and Data Structures