Why study algorithms?

Their impact is broad and far-reaching.

- **Internet.** Web search, packet routing, distributed file sharing, ...
- **Biology.** Human genome project, protein folding, ...
- **Computers.** Circuit layout, file system, compilers, ...
- **Computer graphics.** Movies, video games, virtual reality, ...
- **Security.** Cell phones, e-commerce, voting machines, ...
- **Multimedia.** CD player, DVD, MP3, JPEG, DivX, HDTV, ...
- **Transportation.** Airline crew scheduling, map routing, ...
- **Physics.** N-body simulation, particle collision simulation, ...

...
Why study algorithms?

Old roots, new opportunities.
- Study of algorithms dates at least to Euclid.
- Some important algorithms were discovered by undergraduates!

Why study algorithms?

To solve problems that could not otherwise be addressed.

Ex. Network connectivity. [stay tuned]

Why study algorithms?

For intellectual stimulation.

“For me, great algorithms are the poetry of computation. Just like verse, they can be terse, allusive, dense, and even mysterious. But once unlocked, they cast a brilliant new light on some aspect of computing.” — Francis Sullivan

“A算法 must be seen to be believed.” — D. E. Knuth

Why study algorithms?

They may unlock the secrets of life and of the universe.

Computational models are replacing mathematical models in scientific inquiry.

20th century science (formula based)

21st century science (algorithm based)

“Algorithms: a common language for nature, human, and computer.” — Avi Wigderson
Why study algorithms?

For fun and profit.

For fun and profit.

Why study algorithms?

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• To solve problems that could not otherwise be addressed.
• For intellectual stimulation.
• They may unlock the secrets of life and of the universe.
• For fun and profit.

Why study anything else?

Why study anything else?

The usual suspects

Lectures. Introduce new material. "all questions answered" during break.

Precepts. Discussion, problem-solving, background for programming assignment.

First precept meets this week

FAQ.

• Not registered? Change precept? Use SCORE.
• See Donna O'Leary (CS 210) to resolve serious conflicts.

Orientation precept (if you have not taken COS 126): W 2/3 5PM room TBA

Coursework and grading

8 programming assignments. 45%

• Electronic submission.
• Due 11pm, starting Tuesday 2/9.

Exercises. 15%

• Due at beginning of lecture, starting Monday 2/8.

Exams.

• Closed-book with cheatsheet.
• Midterm. 15%
• Final. 25%

Staff discretion. To adjust borderline cases.

everyone needs to meet me in office hours
Resources (web)

- Course content.
- Course info.
- Exercises.
- Lecture slides.
- Programming assignments.
- Submit assignments.

Booksites.

- Brief summary of content.
- Download code from lecture.

Resources (books)

Required readings.

- Algorithms in Java, 3rd edition, Parts 1-5. [stay tuned for selections online]
- Algorithms in C, 2nd edition. [stay tuned for selections online]

Recommended Java reference.

- Introduction to Programming in Java. [Labyrinth books]