Home

CS 374

ALGORITHMS & MODELS OF COMPUTATION

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Course Staff

Instructors:
- Jeff Erickson
- Lenny Pitt

Assistants:
- Naveen Arivazhagen
- Hsien-Chih Chang
- John Lee
- Brad Sturt

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- Jeff's lecture notes on Algorithms
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- Margaret and Sariel's CS 373 notes
- Margaret's CS 173 lecture notes
- Lenny's colorful notes on TMs and Computability
Announcements

- All homework and exam solutions have been removed.

- May 16
  - On Moodle, your **ACTUAL** total course percentage, upon which your final grade is based, will appear in the field entitled, not surprisingly, "Actual Total Course Percentage". You should ignore other aggregate information.

- May 11
  - Solutions and tentative rubrics for the final exam are available.

- May 9
  - **THE FINAL EXAM IS IN ROOM 1109 and 1214 Siebel Center today at 7pm.** Show up at either room, we'll load-balance as needed.

- May 6
  - Practice problems on undecidability and NP-hardness are available.

- April 28
  - Homework 10 is due Tuesday, May 6.

- April 15
  - Homework 9 is due Tuesday, April 22.

- April 9
  - Midterm 2 will be offered tomorrow evening, April 10, from 7pm to 9pm, in 0216 Siebel. The exam will primarily focus on the following material:
    - Dynamic programming
    - Greedy algorithms
    - Minimum spanning trees and shortest paths
    - Context-free languages and grammars
  
  - **Practice problems on the algorithmic material are available.** These are almost all taken from old CS 473 exams.
  
  - Of course, some exam questions may require knowledge of earlier material (recursion, graph traversal, regular languages, etc.), but that material will not be the main focus of any exam question.
  
  - Like Midterm 1, you may bring one double-sided 8.5"x11" cheat sheet to the exam.
  
  - There is no head-banging session today and no lecture tomorrow. There will be optional review sessions in 1109 Siebel during the regular class times.

- April 7
  - Homework 8 is due Tuesday, April 15.

- April 1
  - Lenny's office hours **tomorrow, April 2** are canceled due to an unavoidable conflict.
* March 27
  * The quiz on CFLs has been released, and is due Friday April 4.

* March 24
  * Homework 7 is due Tuesday, April 8.
  * A quiz on CFLs will come out soon, and be due Friday, April 4.

* March 14
  * Homework 6 is due next Friday, March 21.

* March 12
  * **Midterm 1 has been graded.** Individual grades are available on Moodle; here is the complete grade distribution. Letter grades are based only on Midterm 1 and should be considered very rough estimates of your final course grade; after all, Midterm 1 counts for only 20% of your overall score. At least in CS 473, many students’ course grades are a full letter-grade higher or lower than their Midterm 1 grade, and a few are even two letters grades different.

<table>
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<th>A-</th>
<th>B+</th>
<th>B</th>
<th>B-</th>
<th>C+</th>
<th>C</th>
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<td>20¼</td>
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Here are statistics for the individual problems. Generally mean > median indicates that a few people did much better than most, and mean < median indicates that a few people did much worse than most.

<table>
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<th>Problem</th>
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* Solutions and rubrics for the midterm are also available.

* February 28
  * There is also a review session from 3-4:30 in room 1105 on Monday March 3. Bring lots of questions.

* February 27
  * There is a REVIEW SESSION from 7-8:30 pm, Monday March 3, in room 1105 Siebel. Come prepared with your questions.

* February 26
  * Contact Prof. Pitt by the end of this week if you will need to take the conflict exam, which is tentatively planned to be administered during any two-hour block of time (your choice) between 8:30am and 1:00pm on Friday, March 7.

* February 24
  * Homework 5 is due Tuesday, March 4. Moodle Quiz 5 has been released, and is due Friday, February 28.

* February 19
  * Police, counsel, fish, pike, horse, felt.

* February 14
  * Homework 4 is due Tuesday, February 25. Moodle Quiz 4 has been released, and is due Friday February 21.
  * Homeworks 0 and 1 have been graded. Grades are available on Moodle, and we will return the graded homeworks in class next week.
  * Homework 1 solutions are finally available. (CS 473 used question 3 in their homework, so we had to wait until they were done.)
  * Homework 2 solutions are also available; rubrics will be added soon.

* February 9
  * Homework 3 is due Tuesday, February 18. Quiz 3 on Moodle has been released, and is due Friday February 14.

* February 8
  * There is a student-run LaTex tutorial session at 1pm Saturday Feb 8, in room 3403 Siebel.
  * Here is an interesting recent paper that describes a regular language of ways to knot a tie, encoded by the regular expression \((T+W+)(TTU+WWU+WT+WW+TT+TW)^*(TTU+WWU)\).
See also recent coverage in *New Scientist* and Mikael Vejdemo-Johansson's web site which serves random tie knots.

- **February 1**
  - Quiz 2 (on finite automata) has been released on Moodle and is due 11:59pm, Friday Feb 7.
- **January 31**:
  - Homework 2 is due Tuesday, February 11.
- **January 30**:
  - Homework 0 solutions are available.
  - For all future homeworks, Handwritten solutions must be submitted on printer paper, with the cover page stapled to the front. In particular, we reserve the right to ignore anything submitted on spiral-bound paper with the frilly bits still attached.
  - We will post solution sketches for the headbangging problems on Piazza, usually a few days after each headbanging session. We strongly encourage students to post their own solutions for feedback; correct and well-written solutions will be awarded extra credit.
- **January 28**:
  - Homework 1 and Quiz 1 are both due next Tuesday, February 4. You may find this game useful for the third homework problem.
  - Police, counsel, fish, pike, horse.
- **January 24**:
  - Only one person showed up to Jeff's office hours yesterday, strongly suggesting that few students have started HW0. Please do not wait until the last day to start working on the homework.
  - A LaTeX template for homework solutions is available.

### A silly puzzle about buffalo

The English word "buffalo" has at least two distinct meanings: A noun meaning "bison", both singular and plural, and a verb meaning "to intimidate". Thus, "Buffalo buffalo buffalo" is a grammatically correct English sentence meaning "Bison (plural) intimidate (other) bison (plural)". The verb "buffalo" can also be used intransitively: "Buffalo buffalo" means "Bison are scary." It can also be used as a command: "Buffalo!" could mean "Intimidate!", although a more likely interpretation is "Hey, look! Bison!" Buffalo is also the name of a city in New York, located near Niagara Falls, but only when capitalized.

Longer sentences can be constructed from more "buffalo"s using relative clauses. For example, the sentence "Buffalo buffalo buffalo buffalo buffalo." could mean any of the following:

- Bison who are intimidated by other bison also intimidate other bison.
- Bison who live near Niagara Falls and who are intimidated by other bison are scary.
- Go forth and intimidate the same bison that intimidating bison intimidate.
- Look out! It's the bison from Niagara Falls that intimidating bison intimidate!

Prove by induction that the string "Buffalo buffalo buffalo ... buffalo.", with any finite number of "buffalo"s, is a grammatically correct (although thoroughly useless) English sentence.

What English words other than "buffalo" have this property? I know of four other examples (although two of them yield rather fanciful sentences).

- **January 23**:
  - Jeff's office hours will be Mondays 11-12 and Thursdays 4-5, in the open area outside 3303 Siebel, starting today.
  - Lenny's office hours will be Tuesdays and Wednesdays, after class until 3pm, in 1210 Siebel, except 1/29 and 2/4.
- **January 21**: Welcome to CS 374!
  - Please pardon our dust. We are still working on setting up the course web site and hiring staff.
  - Here is a handout covering material on uncomputability discussed at the end of the first lecture. Read at your leisure, we won't be jumping in to these topics until much later in the course.
  - Homework 0 is due next Tuesday in class.
  - Moodle Quiz 0 is due next Tuesday at noon. All registered students should be automatically enrolled soon, but you can also enroll yourself with the password CS374.
  - Please sign up on Piazza; the enrollment password is CS374.
  - Enrollment: Because this is a pilot offering of a new class, we have limited enrollment to only 43 guinea pigs, brave volunteers, initially chosen at random from the almost 200 computer science and computer engineering majors who filled out the initial interest survey last November. We have asked for enrollment to be opened to all CS and CE majors who have taken CS 173 and CS 225 (but not CS 373), on a first-come first-served
basis: however, these slots will disappear quickly. We expect to offer a larger pilot in Fall 2014, tentatively with an enrollment cap of 100, and then offer the class at full scale (400+ students per semester) starting Spring 2015.