

Problem Solving Seminar, Fall 2011

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Place: LSRC D106

Goals

The goals of 149s are to:

1. Improve your problem-solving skills. While we will be focusing mainly on the theory and implementation of algorithms, the material covered in this class is applicable to many other types of problems.
2. Have fun doing programming competitions. (See the section on ACM-ICPC below.)

Prerequisites

There are no hard prerequisites for this course, and all students are encouraged to attend. We would like students to be comfortable with mathematical/logical reasoning, as well as writing simple programs without much hand-holding. Please contact an instructor or TA if you're concerned about whether or not you should enroll.

Class Structure

Problems

There will be weekly problem sets based on a specific topic. Sometimes we may ask you to do a particular problem on the next week's problem set to prepare for lecture. It is expected that every student in the class is capable of looking up and implementing a particular algorithm, possibly with help from a friend, instructor, TA, or other resource.

Class

The class agenda may vary each week, but expect a brief lecture and lots of time to work on the weekly problem set. Please bring your laptop.

Scrimmages

Scrimmages are practice sessions held under competition-like conditions (i.e. ~5 hours, teams of your choice, other universities participating). We expect there will be about 6 scrimmages this year; exact times are TBD, and we'll send out the details as soon as we know them (usually a week in advance).

Participation in scrimmages is not mandatory, though it is highly recommended. If you can't come for the whole thing, come for what you can, as any experience will help you out come the actual

competition.

ACM-ICPC Mid-Atlantic Regionals

One of the main purposes of this class is to prepare you for the annual ACM International Collegiate Programming Competition (ACM-ICPC). The ICPC consists of two rounds: regionals and world finals. The top team from each region is guaranteed a place in the finals. Additional teams may also be selected to participate, but only one team per school may advance to finals. Duke hosts one of the many sites for the Mid-Atlantic region, which generally consists of about 180 teams. **This year's regional competition will be held on Saturday, November 5th, 2011, and World Finals will be held in Warsaw, Poland in May 2012.** Duke has sent a team to the world finals every year but one since 1994. Students compete in teams of three students, sharing one computer between them. Teams will be selected based on various criteria, including:

- the number and difficulty of the problems you've solved
- participation and performance in scrimmages
- your preferences

We will try to select teams that work well together and have a high chances of going to finals . Teams will be finalized several weeks before regionals, giving you time to practice with your teammates.

Additional Discussion Sessions

If there is enough demand, we may hold additional weekend sessions to discuss particularly challenging or interesting problems. Attendance will, of course, be optional.

Requirements for an A-

1. Attend ACM-ICPC Regionals

If you are enrolled in this class, participation in the Mid-Atlantic regionals is mandatory. Regionals will be held on November 5th, 2011. Please plan for the competition to take the whole day. If you have an extenuating circumstance that prevents you from participating, please discuss the matter with the instructor before the drop/add deadline.

If you don't attend regionals, you'll lose a letter grade in this course.

2. Submit Problems Every Week

You must submit at least 2 problem each week. Problems are due at 5PM on the day of class and can be submitted via email to the instructor.

Turning in problems late will reduce the amount credit for problems. If we notice you habitually turning in problems late, expect an email from us. Missing problem lots of problem sets can cause your grade to drop considerably.

3. Attend Class

If you miss more than four classes, you lose a letter grade in this course. If you feel like class is not

working well for you, talk with me and we'll see if we can address your concerns, but don't just stop attending.

4. Do the Final Project

Details TBA after regionals.

Getting an A/A+

With a minimal amount of work, you can get an A- in the course. To get an A or A+, you should:

- Frequently attend the scrimmages (if have some circumstance that makes it difficult to attend scrimmages, talk to your instructor and we can work out a good accommodation)
- Do more than the required minimum number of problems

The criteria for an A or A+ will be determined by the instructor at the end of the course.

Getting Help

Get help! This course is about improving your coding skills, not banging your head against the wall. We highly recommend working with other students or asking instructors/TAs for help. While we would like you to submit your own solutions, do not get stressed if your code is similar to somebody else's.

Auditing

Anyone is welcome to audit the course. If you are sitting in on a class, we would like you to complete the relevant assigned problem due before that class --- otherwise you may not get much benefit from coming. Also, feel free to attend the scrimmages.

Useful Links

Course Website -- <http://www.cs.duke.edu/courses/cps149s/fall11/>

TopCoder -- <http://community.topcoder.com/tc>

ICPC -- <http://cm.baylor.edu/welcome.icpc>

Mid-Atlantic Region Website -- <http://midatl.radford.edu/>

Mid-Atlantic Region Problem Archive -- <http://midatl.fireduck.com>

Siyang's Code Repository -- <http://canada.doesntexist.com/competitions>

Kevin's Code Repository -- <http://www.duke.edu/~kmk21/149s>

Algorithms (Dasgupta, Papadimitriou, Vazirani) -- <http://cs.berkeley.edu/~vazirani/algorithms.html>