

Lipscomb University, College of Computing and Technology

CS 2252 Competition Programming (2 hours)

Term: Spring 2019
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Office Hours: MW 1pm-5pm, TR 9am-Noon, or by appointment

College Mission

The mission of the College of Computing and Technology is to advance scholarship in key domains of computing and technology to our students by serving the computing and technology community as well as society at large, connecting to key industries, influencers, and thought leaders in the computing and technology arena, and innovating through up-to-date curricula and impactful research that will enhance the computing and technology community in Nashville and beyond.

Course Description

Introduction to an interesting variety of subjects in programming, algorithms, and discrete mathematics through puzzles and problems which have appeared in the International ACM Programming Contest and similar venues. Skills required for programming contests, which include evaluation of problem difficulty, solving problems in teams, and working under time pressure. Implementation of algorithms will be done in an object-oriented programming language such as C++ or Java. It is expected that the best students from this course will represent Lipscomb at the regional ACM Programming Competition and possibly at the international ACM Competition.

Learning Outcomes

After completing this course, a successful student should be able to:

- categorize and estimate difficulty of contest problems
- quickly perform algorithm analysis to determine whether time/space complexity of a solution is acceptable
- identify, formulate, and implement dynamic programming problem solutions
- create tricky test input and corresponding correct output for testing solutions
- quickly implement solutions to trivial/easy problems
- implement solutions to problems from multiple categories
- experience multiple contest environments

Measurement Rubrics

An “A” student almost always finds the correct solution, even if the problem presented is unusual or “hidden”. Their implementations are both completed in a time appropriate for a contest and perform well enough to pass contest time limits. Their program solutions handle all cases including tricky, problematic edge cases.

A “C” student usually finds the correct answer, especially for easy or common cases, but misses unusual or “hidden” instances. Their implementations may take longer than necessary both to write and to run. Their program solutions solve easy cases but fail for tricky, problematic edge cases.

Content and Format

Class meetings are a combination of presentation, discussion, and demonstration. Questions about previous content and especially homework are encouraged, and may affect pace and therefore schedule (see disclaimer below). Adjustments may be made as needed to accommodate learning.

Several contest problems, designed to demonstrate the programming learning outcomes above, will be assigned and assessed. Collectively, they may require more than one work session each week--plan your time accordingly. Start early so you can ask questions in class or via Piazza. (50% of grade)

One mid-term exam is used to assess the non-programming learning outcomes described above. (10%)

Three contest-format events will be held during the semester, students are required to participate in at least two of them. The "final" will also be a contest, it will be Saturday, April 27 from 8:00am to 11:00am. (40%)

Communications

Grades, assignments, and other information will be posted to Canvas. However, Piazza is the second official communication tool for this course. You are expected to check in regularly and/or subscribe to notifications from both these tools.

Piazza is specifically designed for student-teacher communication about homework projects. It provides a threaded discussion forum to get you the help you need as fast as possible. It also encourages cooperation without compromising your integrity. I encourage you to use it both to ask questions and support your peers.

Textbook

Competitive Programming 3 by Steven Halim and Felix Halim

Your text is available in print and as an eBook from [Lulu.com](https://www.lulu.com). You are expected to read the assigned sections.

Attendance

Attendance is expected. Research demonstrates a positive correlation between attendance and course performance. In this class, respectful participation is required. If you miss class, you must take responsibility for your absence. Being responsible means you inform your instructor as soon as you know you will be absent (this almost always means *before* missing class). Being responsible also means you should obtain notes and information missed as the result of any absence.

Late Work / Missed Exam

Late work is not accepted, even for university excused absences, however the due date may be changed at the "halfway" point for the assignment. You must show evidence of substantial effort and a schedule of future efforts to qualify for an due date extension. The midterm will be rescheduled for university excused absences.

Students with Disabilities

If you have a documented disability and wish to discuss academic accommodations, please feel free to contact your instructor or the Academic Success Center.

Academic Integrity

Violations of academic integrity and other forms of cheating, as defined in the university Academic Integrity policy, involve the intention to deceive or misrepresent. They are, therefore, a form of lying and represent actions contrary to the behavioral norms that flow from the nature of God. Alleged violations will be addressed as described in the policy. Students found guilty of an act of academic dishonesty in this course will be subject to the following actions. A first violation will result in: a *negative* score for the full value of the work submitted; no make-up or retake will be allowed; appropriate offices will be notified. A second violation will result in: an F in the course and a recommendation of immediate suspension from the university.

All assignments are individual efforts, not team or group work, unless designated explicitly in the assignment. I encourage you to converse with others, but the work that you turn in must be the product of your effort alone. This means you must not share your solutions with anyone else.

License to Use Work

Students agree that by taking this course, all required work may be subject to similarity review and may be included as source documents in reference databases such as www.turnitin.com or similar platforms. Your work will be included as part of continuous improvement processes and/or education research.

By continuing in this course, you hereby grant your instructor and this institution a non-exclusive, perpetual, irrevocable, worldwide, fully paid-up, and royalty-free license to use any artifact created or modified as part of this course.

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