COS 487: Theory of Computation **Fall 1998**

Handout 2: November 9

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Every student in the course is expected to do a mini-project between now and December 11. The goal is to read up on some topic related to the course and present that topic at a marathon evening session that will be held around December 11. You will also have to write a 1-2 page report on your readings and turn it in by January 11 (or earlier, if you wish).

You can do a mini-project either on your own or in small groups of up to three people. Please let me know your group before Thanksgiving break, i.e., by Wednesday, Nov. 25. Only one person from each group will make the oral presentation (you can choose which person that will be), but every one must turn in a separate written report. *There must be no collaboration while writing the report.*

Some topics from past years are listed below. Of course, I would love it if you ignored this list and came up with new topics of your own.

1. Uses of finite automata in systems modeling.
2. Uses of finite automata in juggling.
3. Uses of context-free grammars in linguistics.
4. Use of grammars to express music harmonies.
5. Gödel's theorem and its philosophical implications (especially with respect to feasibility of AI).
6. Why computer viruses are here to stay.
7. Complexity-theoretic notion of "randomness".
8. Dealing with NP-completeness in practice: Approximation algorithms, Average-case analysis, etc.
9. NP-complete problems in VLSI layout, scheduling, or other application areas.
10. Cryptography.