Welcome to CSE 322: Intro. to Formal Models

- More popularly known as: Theory 101
- Instructor: Rajesh Rao (rao@cs.washington.edu)
- TAs:
  - Sai Zhang (szhang@cs)
  - Kristin Weber (kweber2@cs)
  - Willy Cheung (wllychng@cs)

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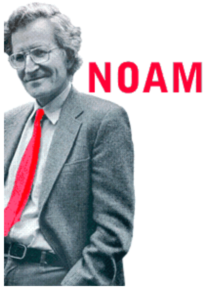
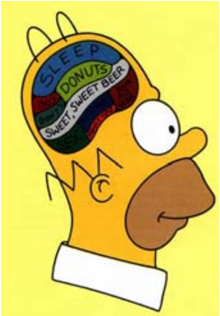
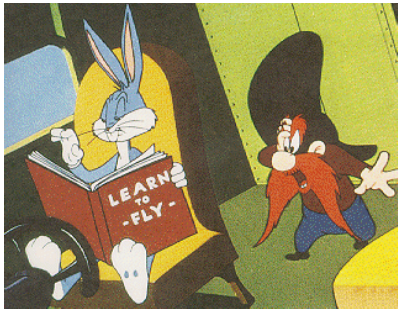
- Guest appearances:

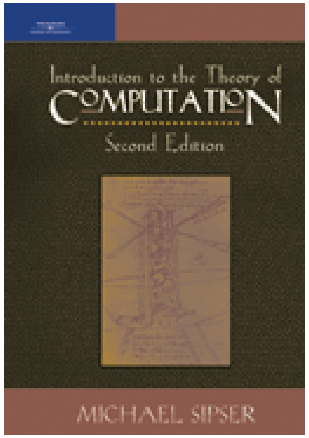






Syllabus and Course Information

- Browse class web page for syllabus and course information:
  - http://www.cs.washington.edu/education/courses/322/10sp/
- Lecture slides will be made available on the website
- Add yourself to the mailing list → see the web page
- Textbook
  - *Introduction to the Theory of Computation 2nd Ed.* (2005)
  - By Michael Sipser (at MIT)



Today’s Agenda

- Course Topics
- Course Goals
- How do I get an A? Homework, exams, etc…
- Review of Selected Topics from Chapter 0
  - Sets and Mathematical Notation
  - Functions and Relations
  - Strings and Languages

Course Topics

- Mathematical Preliminaries (Chap. 0)
- Regular Languages and Finite Automata (Chap. 1)
- Context-Free Languages and Pushdown Automata (Chap. 2)
- Turing Machines and the Church-Turing Thesis (Chap. 3)
- Decidable and Undecidable Languages (Chap. 4)
- Selected topics from Chap. 5

Course Goals

- General Goals:
  - Learn to mathematically express and analyze a problem or statement about computation
  - Learn to prove mathematical theorems about computation
  - Hone your analytical skills for your future career!

Course Goals

- Specific Goals:
  - Understand how problems can be classified as computationally "easy" or "hard" using *abstract computational "machines"*
  - Learn about regular expressions, finite automata, context-free grammars, and Turing Machines
  - Discover their *applications* in string searching, compilers, hardware design, programming languages, and algorithmic analysis

How do I get an A in this class?

- Answer: *Practice*, *Practice*, *Practice* (solving problems)
- Weekly homework assignments (50%)
  - Total of about 7 assignments
  - Collaborative/group work is encouraged but *only after you have tried to solve each problem by yourself first*
    - No copying of solutions – explain in your own words!!
    - See Course Policies regarding this on the Web
  - No late submissions: due at the *beginning of class* on due date
- Midterm exam (20%)
  - Monday, May 03, 2010, in class
- Final exam (30%)
  - Monday, June 07, 2010, 2:30-4:20 pm, MGH 241

Okay, time to wake up…

Let’s begin with some basics…

- Review of things you probably already know:
  - Sets and mathematical notation
  - Functions
  - Strings
  - Languages

Next Class: Proving things – how and why…

- Things to do:
  - Visit course website
  - Sign up for mailing list (instructions on website)
  - Read Chapter 0