Final Exam Review

Did I happen to mention?

- Final exam
  - The date for the Final has been decided:
  - Saturday, November 16th
  - 12:30pm – 2:30pm
  - 07 – 1420

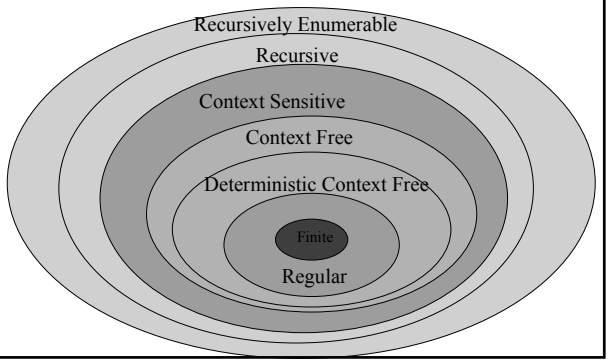
Ground Rules

- Format
  - 6 questions
  - Lowest graded question will be dropped.
  - Closed Book
    - One page of notes okay.

Most important question…

- All together now!
  - What is a language?
  - What is a class of languages?

Most important diagram



The First Half

- Regular Languages
  - Regular Expressions
  - Finite Automata
    - NDFA, NDFA-Λ
  - Kleene Theorem
  - Minimal FA
  - The Pumping Lemma

After the Midterm

- Context Free Languages
  - Grammars
    - Context Free / Regular Grammars
  - Ambiguity, Parse Trees
  - Pushdown Automata
  - Closure Properties
    - Union, Concatenation, Kleene* - okay
    - Intersection, Complement, Difference -- no
  - Pumping Lemma for CFLs

After the Midterm

- Context Free Languages – algorithms
  - RE to CFG
  - FA to PDA
  - CFG to PDA
  - PDA to CFG (Not on exam)
  - Chomsky Normal Form
    - Remove Λ Productions
    - Remove Unit Productions
    - Place into CNF

After the Midterm

- Turing Machines
  - Basics
  - Computing a Function
  - Accepting vs. Recognizing a Language
  - Recursive vs. Recursively Enumerable Languages.
  - Universal TM

After the Midterm

- Unsolvable Problems
  - TM as a model of computation
  - Problem encoding
  - Solvable == recursive
  - Reduction of problems
    - Self-Accepting as first unsolvable problem.
    - Using reductions to show problems to be unsolvable.

After the Midterm

- Computational Complexity
  - Polynomial vs Exponential Running Time
  - P, NP, NP-Complete

Questions?