

Outline for Lecture 1

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1. Administrivia
2. Why take this course?
 - Some cool examples...
 - What can be computed?
 - What can be proved?
 - How hard is it to compute/prove?
3. Problems with basic notions
 - What is a set?
 - Informal definitions
 - A paradox...
 - What is a statement?
 - Informal examples
 - A paradox
 - Recursion must be respected!
4. Languages
 - A language is a subset of finite strings...
 - How many languages are there?
 - How many can we describe?
5. Regular Languages
 - Regular languages closed under union, concatenation + Kleene Star
 - Are they closed under intersection?
6. Finite State Machines 1
 - Definition + Example - what is an automata
 - Nondeterministic Automata

- Probabilistic Automata

7. Cool language results

- Nondeterministic=deterministic
- Regular languages can be recognized by nondeterministic finite-state machines
- Probabilistic is complicated!
 - isolated cutpoint theorem