MS205 Automata Theory Dec 11th, 2013

Handout 1: Problem Set 1

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Due by Friday, Dec 13th, 8pm.

Problem 1 Create finite automata for each of the sets

1. Number of 0s equal 2 mod 3.
2. Number of 0s is even and number of 1s is divisible by 3.
3. At least 3 consecutive occurrence of 4 consecutive 0s.

Problem 2 Prove that the number of subsets of the set of all finite length strings is not countably infinite.

Problem 3 Which of the following sets are countably infinite and which are not. Give a brief explanation of why.

1. all finite length strings over a finite alphabet.
2. all finite automata
3. all computer programs
4. all subsets of integers
5. all subsets of a countably infinite set