CS 254 HW1

Grading

- Due 2014-01-16 @ 2pm. (Right before class).

- Please send all submissions (both LaTeXed and handwritten) to cs254-win1314-hw@lists.stanford.edu

Problem 1

Prove: if P = PSpace, then ExpTime = ExpSpace.

Problem 2

A (m, n)-circuit is a directed acyclic graph with m input wires, n output wires, and all intermediate nodes are nand gates. The size of a circuit is the number of wires in the circuit.

Two circuits are equivalent if they represent the same function $\{0, 1\}^m \to \{0, 1\}^n$.

Show that if P = NP, then there exists a polynomial time algorithm (where input size = size of original circuit) which outputs an equivalent circuit of minimal size.