

CS 254 HW4

Grading

- Due 2014-02-06 @ 2pm. (Right before class).
- Please send all submissions (both L^AT_EXed and handwritten) to cs254-win1314-hw@lists.stanford.edu

Sampleable/Computable Distributions

Let $\{D_n\}$ be a family of distributions where each D_n is a distribution over $\{0, 1\}^n$.

We say that $\{D_n\}$ is **polynomial time sampleable** if there exists a probabilistic polynomial time turing machine A such that: $\forall n \forall x \in D_n : \Pr[A(1^n) = x] = D_n(x)$.

We say that $\{D_n\}$ is **polynomial time computable** if there exists a deterministic polynomial time turing machine A such that: $\forall n \forall x \in D_n : A(x) = \sum_{y < x} \Pr[D_n(y)]$.

Prove: If all polynomial time sampleable distributions are polynomial time computable, then $P = P^{\#P}$.