Theory of Computation

Homework 5

Due: 2012/12/25

Problem 1 (Chernoff Bound) Suppose x_1, x_2,...,x_n are independent random variables taking values 1 and 0 with probabilities p and $1-p$, respectively. Let $X = \sum_{i=1}^{n} X_i$. Then for $0 \leq \theta \leq 1$, $\mathbf{Pr}[X \leq (1-\theta)pn] \leq e^{-\frac{\theta^2 pn}{2}}$.

Problem 2 Recall that EXP = TIME(2^{n^k}). Show that BPP $\subseteq$ EXP.