Homework Assignment #5
Due: November 2, 2010

1. If L is a language over the alphabet $\{0, 1\}$, define $L' = \{x\#0^{|x|^2} : x \in L\}$.

    (a) Prove that $L' \in \mathbf{P} \Rightarrow L \in \mathbf{P}$.

    (b) Prove that there is a language L such that $L' \in \mathbf{SPACE}(\sqrt{n})$ and $L \notin \mathbf{SPACE}(\sqrt{n})$.

    (c) Prove that $\mathbf{P} \neq \mathbf{SPACE}(\sqrt{n})$.