Last Tutorial
Additional Questions
Not to be Handed In

1. Show that NP is closed under the star operation.

2. Let $HALF - CLIQUE = \{\langle G \rangle \mid G$ is undirected graph having a clique of size at least $m/2$ nodes, where m is the number of nodes in $G\}$. Show that $HALF - CLIQUE$ is NP-complete.

3. In the following solitaire game, you are given $m \times m$ board. On each of its m^2 positions lies either a blue stone, a red stone, or nothing at all. You play by removing stones from the board so that each column contains only stones of a single color and each row contains at least one stone. You win if you achieve this objective. Winning may or may not be possible, depending upon the initial configuration. Let $SOLITAIRE = \{\langle G \rangle \mid G$is a winning game configuration$\}$. Show that $SOLITAIRE$ is NP-complete. *Hint: reduce from* $3SAT$.

4. You've seen that $3SAT$ is NP-complete. However, $2SAT$ is *(computationally)* easy. Show that $2SAT \in P$.