CIS 621: Algorithms and Complexity
Winter 2008

Assignment 4

due Monday, March 3, 2008

1. chapter 6, exercise 24, pp 331-332. Be sure to
   - describe the subproblem
   - show a recurrence for the subproblems
   - show the code filling out the table for the subproblem solutions
   - show how to reconstruct the solution (show the division of the precincts)
   - analyze the time
2. Consider the *Dominating Set* problem, abbreviated as *DS*. Given a graph $G = (V, E)$ and integer k, determine whether there is a subset $D \subseteq V$ of size at most k such that D is a dominating set: for every node $v \in V - D$ there exists a node $u \in D$ such that $(u, v) \in E$.

   Show that *VC* reduces to *DS*.
3. Show how to use cycle detection methods (say from DFS or transitive closure) to solve *2SAT* in polynomial time. How much time is needed?