

**600.271 Automata & Computation Theory**  
**Assignment 9**  
**Due: May 2, 2013**

I. Problem Set 7, Problem III (page 146).

II. In a graph with an  $n$  vertices, a Hamiltonian path is a simple path that includes all vertices and a Hamiltonian cycle is a simple cycle that includes all vertices. Assuming the NP-completeness of each of these problems, prove the NP-completeness of the other problem.

III. Show the NP-completeness of the following problems.

1. Given a monotone CNF boolean expression and a value  $k$ , does there exist a satisfying assignment in which at most  $k$  variables are set to **T**. (In a monotone boolean expression, no variable appears as complemented.)
2. The CNF SAT problem with the additional constraint that no clause contains more than one complemented variable.