Homework 4
Computer Science 511
Fall 2008
Due by 5 PM on Friday, October 17

Reading Assignment

Problem Set


2. (10 points) Search versus decision. Suppose you have a procedure that runs in polynomial time and tells you whether or not a graph has a Hamiltonian cycle. Show that you can use it to develop a polynomial time algorithm that constructs a Hamiltonian cycle, if one exists.

3. (10 points) Show that an otherwise polynomial-time algorithm that makes at most a constant number of calls to polynomial-time subroutines runs in polynomial time, but that a polynomial number of calls to polynomial-time subroutines may result in an exponential-time algorithm.

   Note. This problem shows why we must be careful when defining the notion of polynomial-time reduction.


   Note. The online and print editions differ slightly. For part (d), it is sufficient to answer the online version; i.e., a $O(|V|^4)$ algorithm suffices — you don’t need to improve this to $O(|V|)$. 
5. (10 points) Exercise 8.10, parts (b), (d), and (g) of DPV, page 279 of the online edition and page 266 of the print edition.