

COMP362 WINTER 2014 ASSIGNMENT 3

Due at 8:30 AM on February 26th 2014

- 1) Show that the following problem is NP complete:

Triangle Cover

Instance: A graph $G=(V,E)$ and an integer k .

Question: Is there a set X of at most k vertices of G such that every triangle of G contains a vertex of X .

- 2) Show that the following problem is NP-complete.

Disjoint Rooted Paths:

Instance: Graph $G=(V,E)$, integer k , and subsets $\{s_1, \dots, s_k\}$, $\{t_1, \dots, t_k\}$ of vertices of G .

Question: Are there k vertex disjoint paths P_1, \dots, P_k of G such that P_i has endpoints s_i and t_i

- 3) Discuss the main differences between the definition of NP-complete given in Sipser and Kleinberg/Tardos. In doing so you may assume that as discussed in class, the notions of certification by a deterministic Turing machine and decision by a non-deterministic machine are equivalent.

Please email your solutions to yuditskyl@gmail.com