Assignment 6

CS 581
Due November 29, 2018

Problem 1 [10 point] Prove that the decision problem variant of the Travelling Salesman Problem you defined in your last assignment is NP-Complete. (You've already proven it's in NP, so you only need to show the reduction)

Problem 2 [10 point] Show that if the decision problem variant of TSP has a poly-time solution then the optimization problem variant of TSP also has a poly-time solution.

Problem 3 [10 point] Co-NP is the class of the complements of the problems in NP. For example, since SAT is in NP, its complement:

$$\{x \mid x \text{ is a formula that is not satisfiable}\}$$

is in Co-NP. Co-NP-complete problems are defined in the usual way. It is not known whether or not Co-NP and NP are the same classes of problems. Show that, if NP and Co-NP are different, then P and NP are also different.