CSE208: Data Structures and Algorithms II Sessional

Online on NP-completeness (A1/A2)

Hamiltonian Cycle Problem: A Hamiltonian cycle is a cycle in a graph that visits each vertex exactly once. The Hamiltonian cycle problem is, given an undirected graph, is to answer whether the graph contains a Hamiltonian cycle.

The Hamiltonian cycle problem is known to be NP-complete.

Travelling Salesperson Problem (TSP): Given a set of cities and distance between every pair of cities, the problem is to find the shortest possible route that visits every city *exactly once* and returns to the starting point.

Prove that the travelling salesperson problem is NP-complete. You can model TSP using an undirected weighted graph.