

CS314: Algorithms

NP-Hardness

In class, March 31

Problems

1. Longest Path

Given a graph G and a variable k , the longest path problem asks if G contains a simple path which visits at least k vertices of G . Prove that longest path is NP-Complete.

2. Hamiltonian Path

Given a graph G , a *Hamiltonian path* is a path which visits every vertex exactly once. Prove that deciding if a graph has a Hamiltonian path is NP-Complete.

3. Subgraph Isomorphism

Given two graphs G and H , the subgraph isomorphism problems asks if G has contains an exact copy of H . Prove that subgraph isomorphism is NP-Complete.