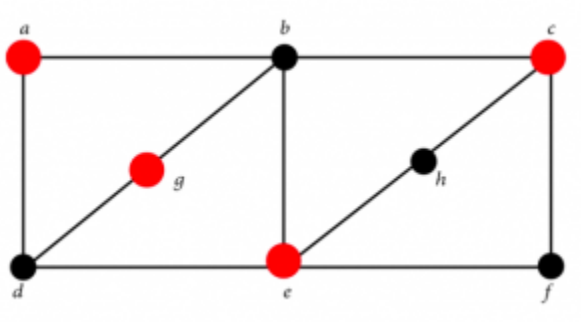
Independent set

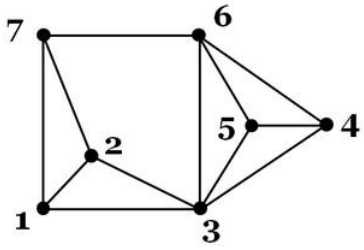
Given an undirected graph $G = (V, E)$, an independent set $S \subseteq V$ is a vertex set in which no two vertices are adjacent, i. e., for all distinct $u, v \in S$, $(u,v) \notin E$. For example, a, g, c, e is an independent set in the following graph.



The decision version of the **independent set problem** is, given a graph $G = (V, E)$ and an integer k, to decide whether G has an independent set of size $\geq k$. The independent set problem is known to be NP-complete.

Clique

Given an undirected graph $G = (V, E)$, a clique is a subset of vertices $K \subseteq V$ of an undirected graph such that every two distinct vertices in the clique are adjacent, i. e., for all distinct $u, v \in K$, $(u,v) \in E$. For example, 3,4,5,6 is a clique in the following graph.



The decision version of the **clique problem** is, given a graph $G = (V, E)$ and an integer k, to decide whether G has a clique of size $\geq k$.

Prove that the clique problem is NP-complete.