MAXIMUM INDEPENDENT SET

Definition: An **independent set** in a graph $G = (V, E)$ is a subset of the vertices so that no two vertices in the subset are adjacent. In other words, $V_0 \subseteq V$ such that $\forall \{v, w\} \subseteq V_0, (v, w) \notin E$.

Decision problem:

- Input: Graph $G = (V, E)$ and integer k
- Question: Does G have an independent set of size k?

Optimization problem: Find the size of the largest independent set in the input graph G.

Construction problem: Find the largest independent set in the input graph G.

NOTE: MAXIMUM INDEPENDENT SET is NP-hard (easy reduction from CLIQUE).