

DOMINATING SET

Definition: A **dominating set** in a graph in G is a subset V_0 of the vertices so that every other vertex in G is adjacent to at least one element of V_0 . In other words, $V_0 \subseteq V$ such that $\forall v \in V - V_0, \exists w \in V_0$ so that $(v, w) \in E$.

Decision problem:

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

Optimization problem: Find the size of the smallest dominating set in the input graph G .

Construction problem: Find the smallest dominating set in the input graph G .

NOTE: Dominating Set is NP-complete.