

Adjacency List

In an adjacency list, for each vertex in the graph, you have a list of its neighbors.

If the graph $G = (V, E)$ is undirected, then
 $List(x) = \{w \in V \mid (x, w) \in E\}$.

If the graph $G = (V, E)$ is directed, then
 $List(x) = \{w \in V \mid x \rightarrow w \in E\}$.

Note that an adjacency list requires $\Theta(m)$ space, where m is the number of edges.

This can be much more space efficient than an adjacency matrix for sparse graphs, but some operations take more time (e.g., checking if an edge is present). See

https://en.wikipedia.org/wiki/Adjacency_list.