1 Graphs

1.1 Directed Graphs

Let $G = (V, E)$ be a directed graph. Let n be the number of vertices and m be the number of edges. We can represent G in either an adjancency matrix or adjancency list. Observe then the time needed for these problems.

Adjacency Matrix

An Ajaceny Matrix takes up $\Theta(n^2)$ in memory. The time it takes to determine if (x, y) is an edge in G is $\Theta(1)$. To determine *all* edges in G it takes $\Theta(n^2)$ time.

Adjacency List

An Adjacency List takes up $\Theta(m + n)$ in memory. The time it takes to determine if (x, y) is an edge in G is $\Theta(n)$. To determine *all* edges in G it takes $\Theta(m + n)$ time.