Adjacency Matrices

Extensions:

- If G has non-zero weights on the edges, then we could let $M_{i,j}$ denote the weight of the edge (v_i, v_j).
- For directed graphs, we distinguish between edges from v_i to v_j and from v_j to v_i; hence, we can get asymmetric matrices.

Note that this representation inherently requires $\Theta(n^2)$ space, even for graphs that don't have many edges.

Given an adjacency matrix, checking if an edge (v_i, v_j) takes $O(1)$ time.

See https://en.wikipedia.org/wiki/Adjacency_matrix.