Adjacency Matrices

$G = (V, E)$ is undirected and does not have any parallel edges (nor weights on the edges), and $V = \{v_1, v_2, \ldots, v_n\}$.

The adjacency matrix M for G is $n \times n$ where

- $M[i, j] = 1$ if $(v_i, v_j) \in E$
- $M[i, j] = 0$ if $(v_i, v_j) \notin E$

If the graph is simple (so no self-loops), then $M[i, i,] = 0$ for all $i = 1, 2, \ldots, n$.
For undirected graphs, $M[i, j] = M[j, i]$; in other words, the adjacency matrix for an undirected graph is symmetric.