

Graphs

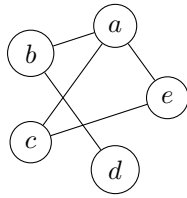
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1 Adjacency Matrices

A finite graph can be represented by a square matrix $n \times n$ where n is the number of vertices.



$$A = \begin{matrix} & \begin{matrix} a & b & c & d & e \end{matrix} \\ \begin{matrix} a \\ b \\ c \\ d \\ e \end{matrix} & \begin{pmatrix} 0 & 1 & 1 & 0 & 1 \\ 1 & 0 & 0 & 1 & 0 \\ 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 \\ 1 & 0 & 1 & 0 & 0 \end{pmatrix} \end{matrix}$$

Every row and column represents a vertex. 1 means that the two vertices are adjacent, 0 otherwise. The diagonal of this matrix will always be 0s since no vertex is adjacent to itself and $A = A^t$