Graph representations in a digital machine.

- Graph representations:
  - Adjacency matrix - a matrix where if there is a 1 at position `(i,j)` that means there is an edge from i to j. For undirected graphs this matrix is symmetric.
  - Incidence matrix - a matrix where each row represents a vertex and each column represents an edge. The value at position `(i,j)` indicates that vertex i is incident to edge j. For directed graphs the value 1 represents the tail and -1 the arrow (although there isn't a standard notation).
  - Edge list - a simple list of tuples where each tuple represents an edge in the graph.
  - Adjacency/Successor list - a dictionary where keys are vertices and values are lists of neighbouring vertices.
- For checking if two vertices are connected the adjacency matrix is preferred, because it can do it in $O(1)$
- For finding all vertices adjacent to some given one the adjacency list is best.