Graphs

Notation:

G graph

V Vertices

E edges

Representation:

- Adjacency List

  - Storage O(|V| + |E|)
  - Add vertex O(1)
  - Remove vertex O(|V| + |E|)
  - Add edge O(1)
  - Remove edge O(|E|)
  - Query O(|V|)

- Adjacency Matrix

  - Storage $O(|V|^2)$
  - Add vertex $O(|V|^2)$
  - Remove vertex $O(|V|^2)$
  - Add edge O(1)
  - Remove edge O(1)
  - Query O(1)

Searches:

- DFS

  - stack
  - DFS Numbering (entrance(d)/exit (f))
    * d value of a vertex u is lesser than the d value of all the descendants of u.
    * f value of a vertex u is higher than the f value of all the descendants of u.
  - visited set
  - cycles?
  - DFS tree?

* forward edge (node to descendant)
* back (node to ancestor)
* cross (neither forward nor back)

- BSF

  - queue

Notes:

- undirected vs directed