

Some examples

For each of the following think about what you should choose for vertices and edges.

The internet.

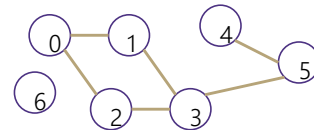
Facebook friendships

Input data for the "6 Degrees of Kevin Bacon" game

Course Prerequisites

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Adjacency List



An array where the u 'th element contains a list of neighbors of u .

Directed graphs: put the out neighbors ($a[u]$ has v for all (u,v) in E)

Time Complexity ($|V| = n$, $|E| = m$):

Add Edge:

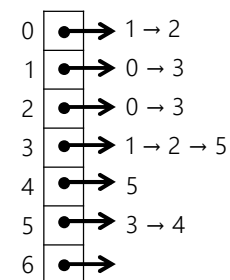
Remove Edge:

Check edge exists from (u,v) :

Get neighbors of u (out):

Get neighbors of u (in):

Space Complexity:



Suppose we use a linked list for each node.

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Breadth First Search

```

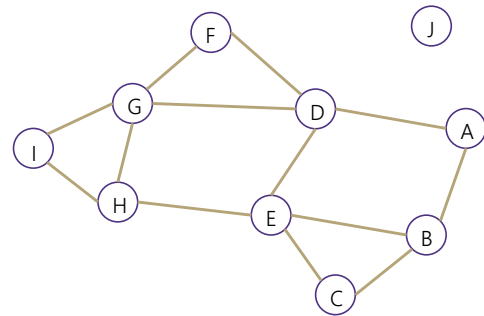
search(graph)
  toVisit.enqueue(first vertex)
  mark first vertex as visited
  while(toVisit is not empty)
    current = toVisit.dequeue()
    for (V : current.neighbors())
      if (v is not visited)
        toVisit.enqueue(v)
        mark v as visited
    finished.add(current)

```

Current node: I

Queue: B D E C F G H I

Finished: A B D E C F G H I



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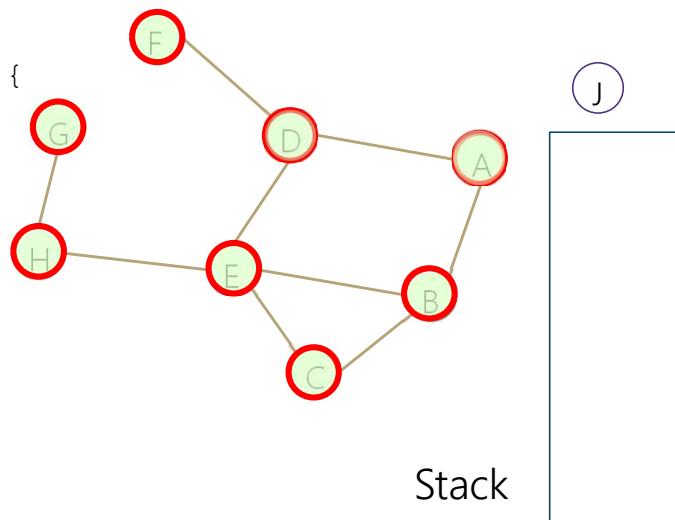
Depth First Search

```

dfs(graph, curr)
  mark curr as visited
  for(v : curr.neighbors()){
    if(v is not visited){
      dfs(graph, v)
    }
  }
  mark curr as "done"

```

Finished: F D G H E C B A



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