cs140 – algorithms
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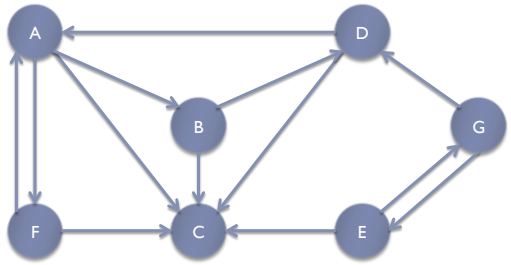
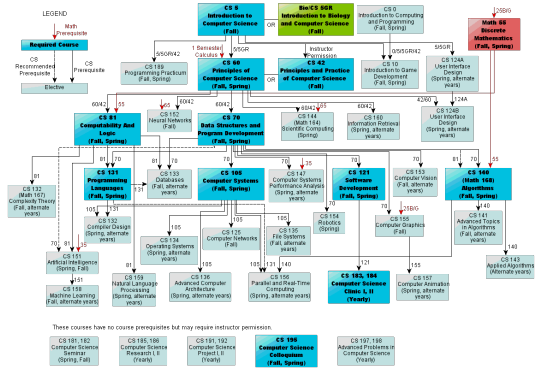
Graph search algorithms

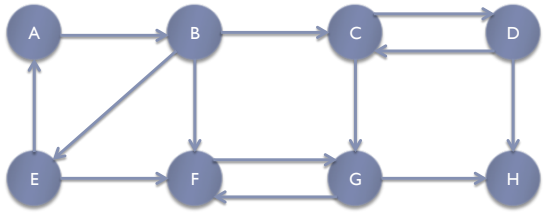
- BFS(G,v)
  - explores reachability
  - computes array d[]
  - can add array p[] so have actual shortest paths
  - O(V+E) running time
- DFS(G,v)
  - visit all the vertices
  - computes start and finish times s[], f[]
  - can add array p[] so have a dfs forest
  - Θ(V+E) running time
  - classification of edges:
    - tree edges
    - forward edges
    - back edges
    - cross edges



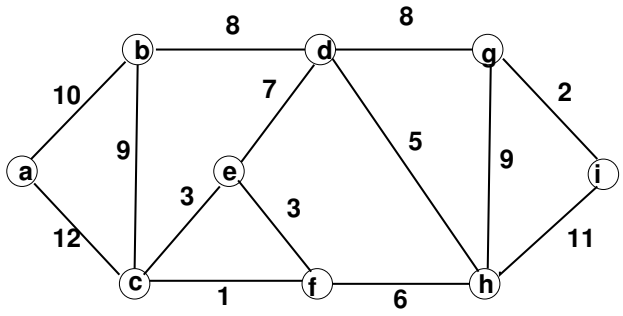
topological sort



(strongly) connected components



Minimum spanning trees



Minimum spanning trees

```
generic-mst(G,w)
  A = emptyset
  while A does not form a spanning tree
        find an edge (u,v) that is safe for A
        A = A U {(u,v)}
  endwhile
  return A
```