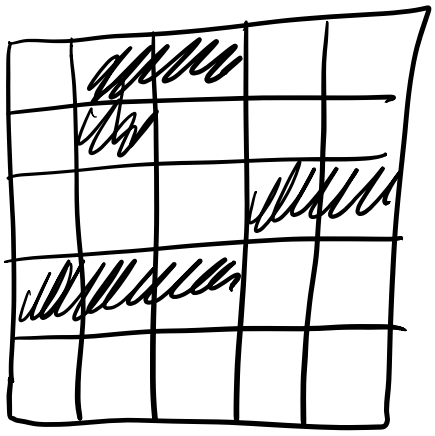
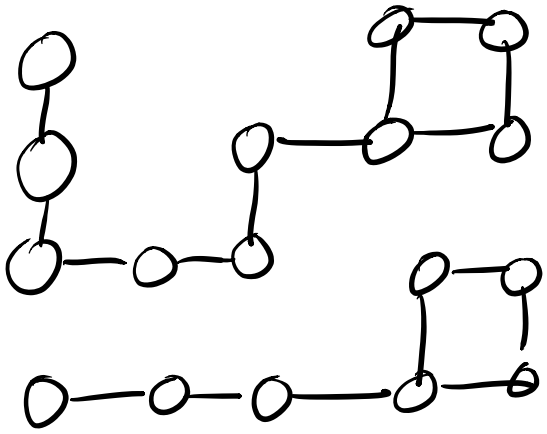


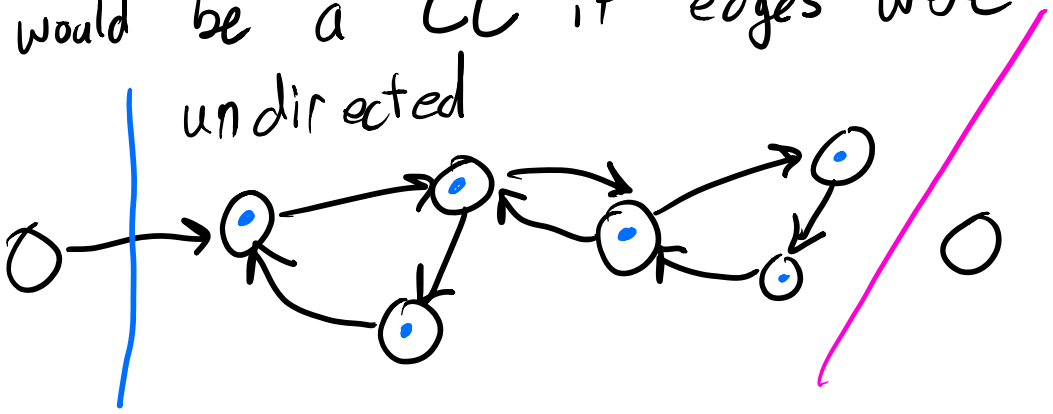


Defn: Connected Component

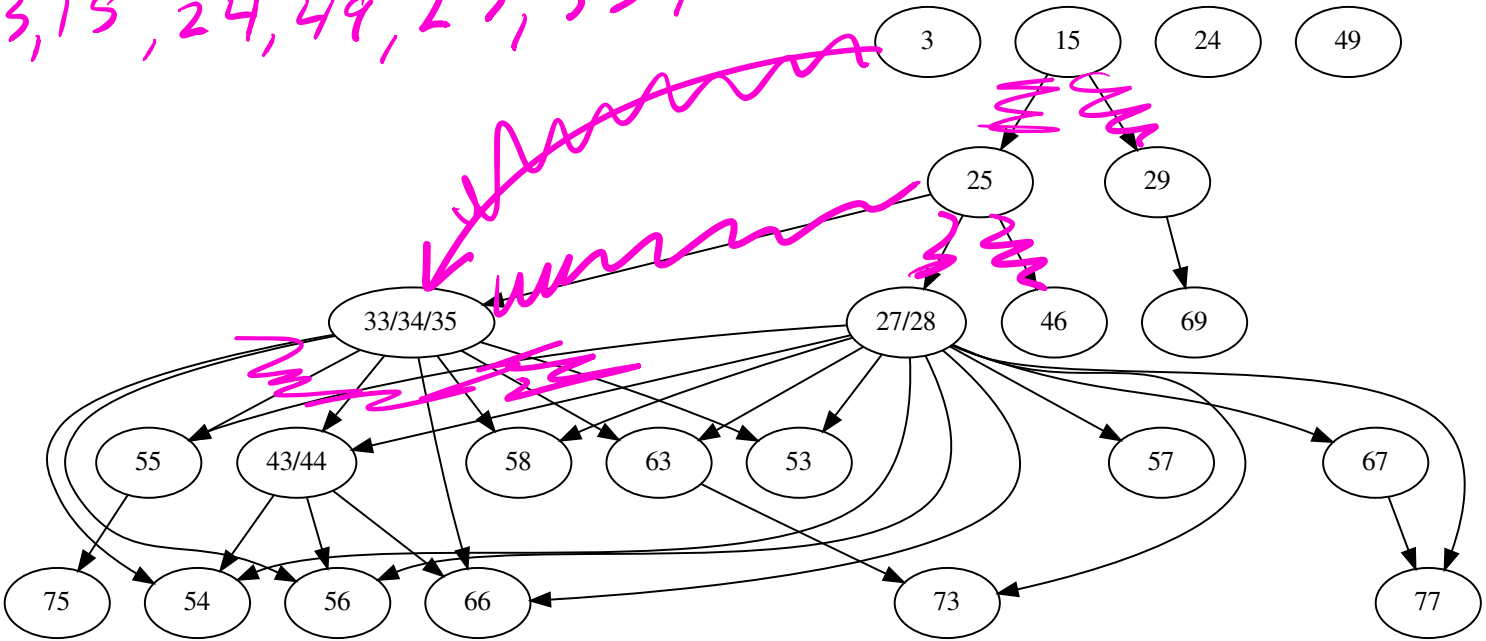
A maximal set of vertices that are mutually reachable.

In a directed graph this is called a "strongly connected component"

Defn: Weakly Connected component would be a CC if edges were undirected



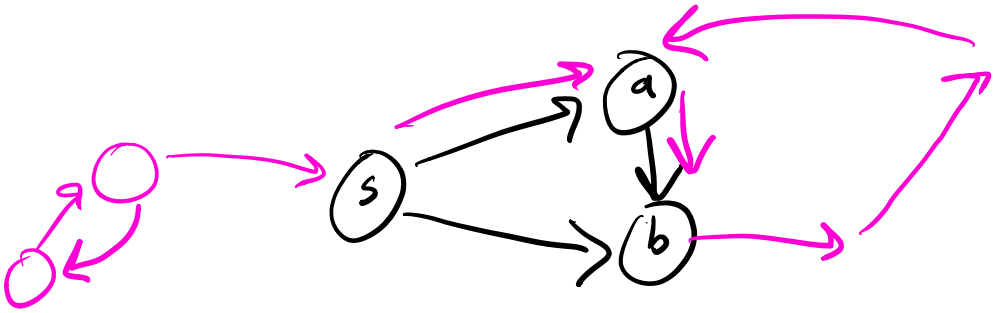
3,15,24,49,25,33,29



A cycle in a directed graph is a path with the same start and end.

Does a graph have a cycle?

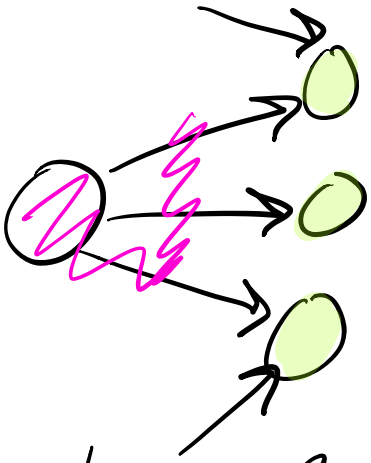
$O(m(n+m))$



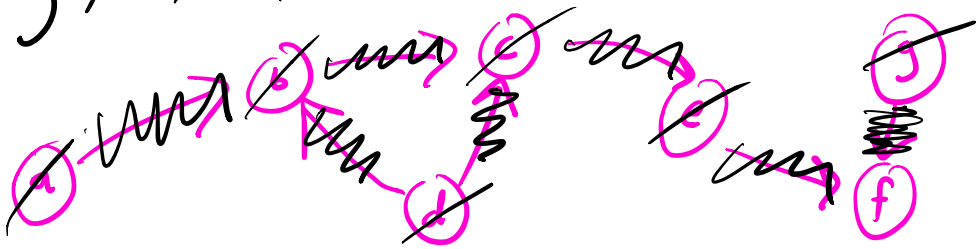
Directed Acyclic Graph DAG

In a DAG $\exists v \in V$ s.t.
v has no in-edges

Topo-Sort: $O(n+m)$



d, g, a, b, c, e, f



a, d, g, b

↙ Not on the test ↘

Kruskal's

sort edges

in increasing order of weight

add to MST if the

src + dst are not in

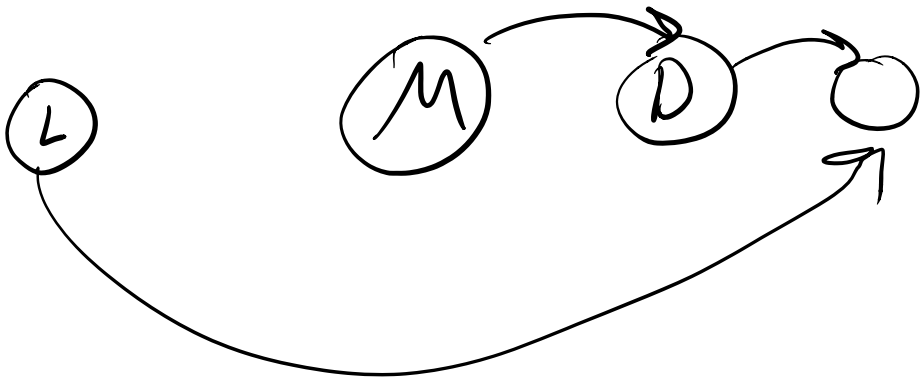
the same CC

Union-Find / Disjoint Set

Tracks disjoint subsets of V

operations:

- find(v): which component v belongs to
- union(s, t): combines s, t → s ∪ t


L
M
D