

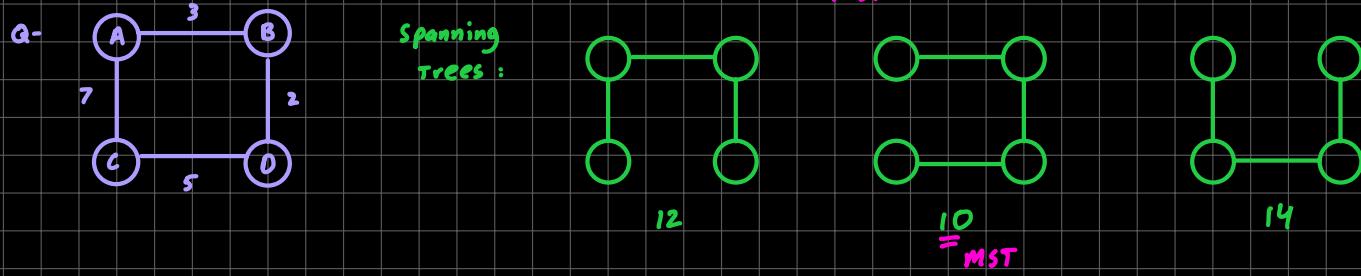
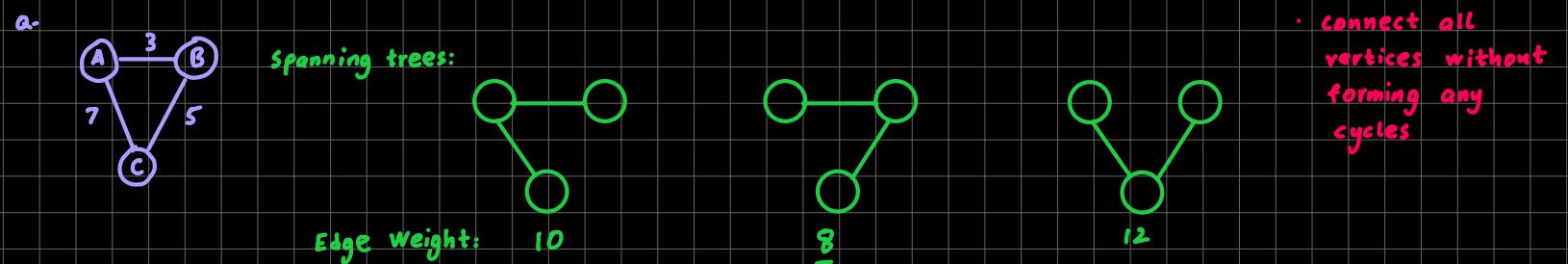
Greedy

- Always Efficient
- Does not guarantee the optimal solution
- Makes the best choice at the ^{current} moment, without considering of its later outcome
- Only applicable on optimization problems
- Optimal substructure

- ① Activity Selection problem
- ② Fractional knapsack

Minimum Spanning Tree (MST)

- MST is a subset of edges from a weighted, connected, undirected graph that connects all vertices together without any cycles, and with the lowest possible total edge weight
- Edge weight:
 - Sum of cost, distance, capacity or any other metric b/w 2 vertices the edge connects



- No of Edges = $|V| - 1$
- Generic Algo:
 - Create set A of edges (representing MST)
 - Incrementally add edges to A (add only safe edge)
- Safe Edge:
 - An edge (u, v) is safe for A iff $A \cup (u, v) \leq$ of same MST

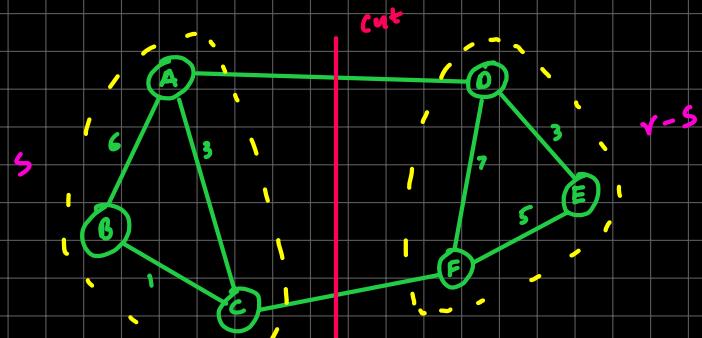
ALGO BSOK:

$A \leftarrow \emptyset$

while A is not a spanning Tree
find a safe edge (u, v) for A
 $A \leftarrow A \cup \{(u, v)\}$

return A

Finding Safe edge



• No edge in A crosses this division

Minimum edge

• Light weight edge chosen which is cut by the line

• Light weight edge is the safe edge

Prim's Algo