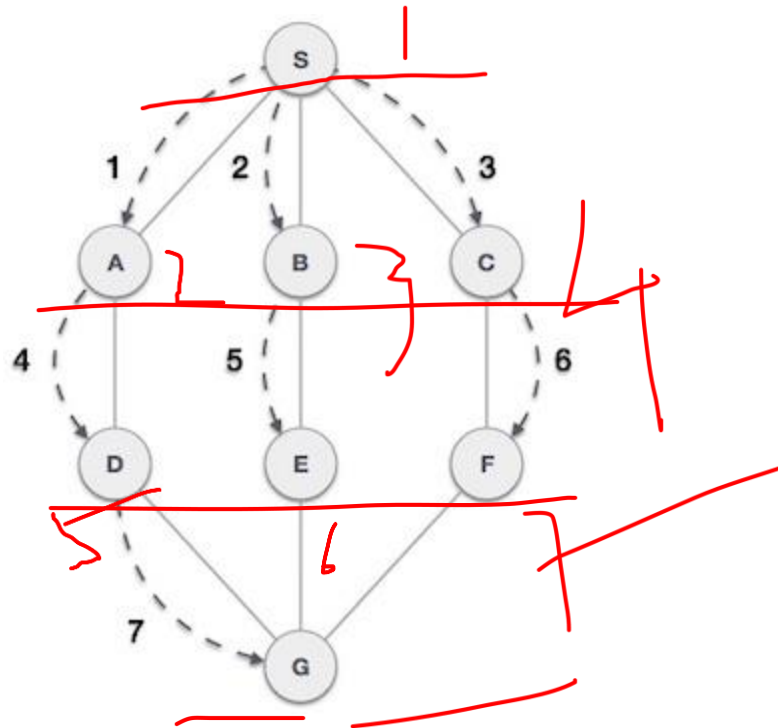


Graph Traversals - BFS & DFS - Breadth First Search and Depth First Search

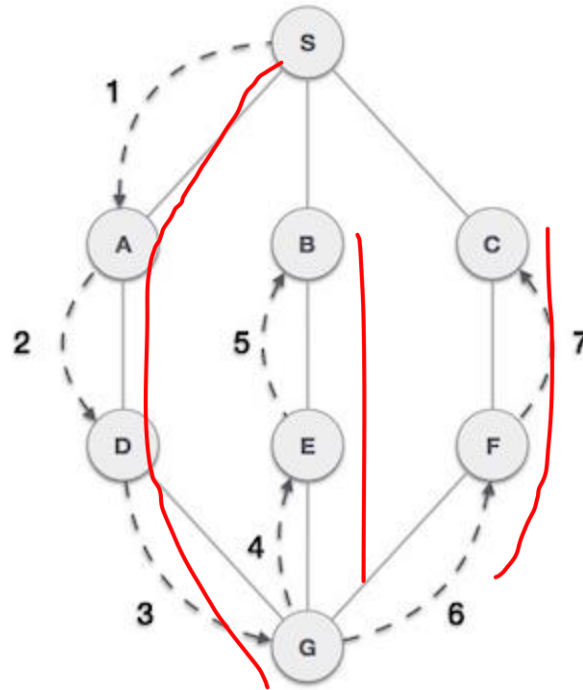
BFS

Breadth First Search (BFS) algorithm traverses a graph in a breadthward motion and uses a queue to remember to get the next vertex to start a search when a dead end occurs in any iteration.



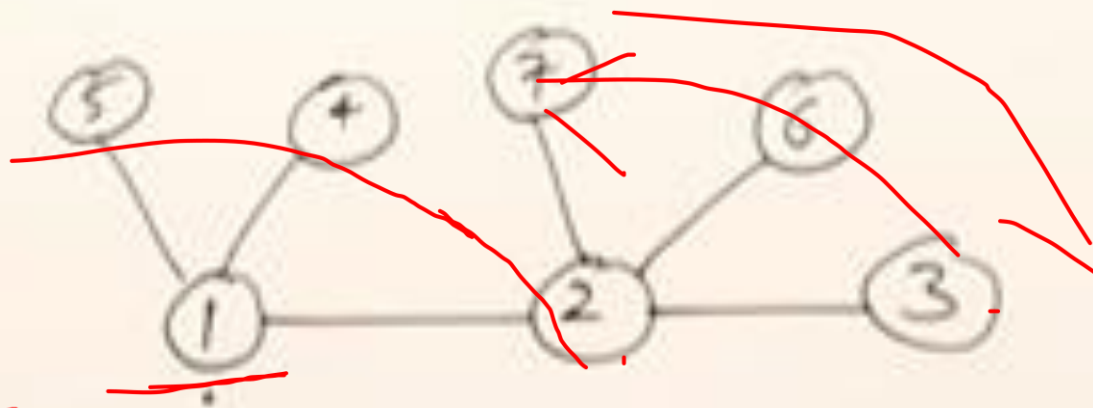
DFS

Depth First Search (DFS) algorithm traverses a graph in a depthward motion and uses a stack to remember to get the next vertex to start a search when a dead end occurs in any iteration.



BFS & DFS

- /. Visiting a Vertex
- || Exploration of Vertex



BFS: 1, 2, 4, 5, 7, 3, 6

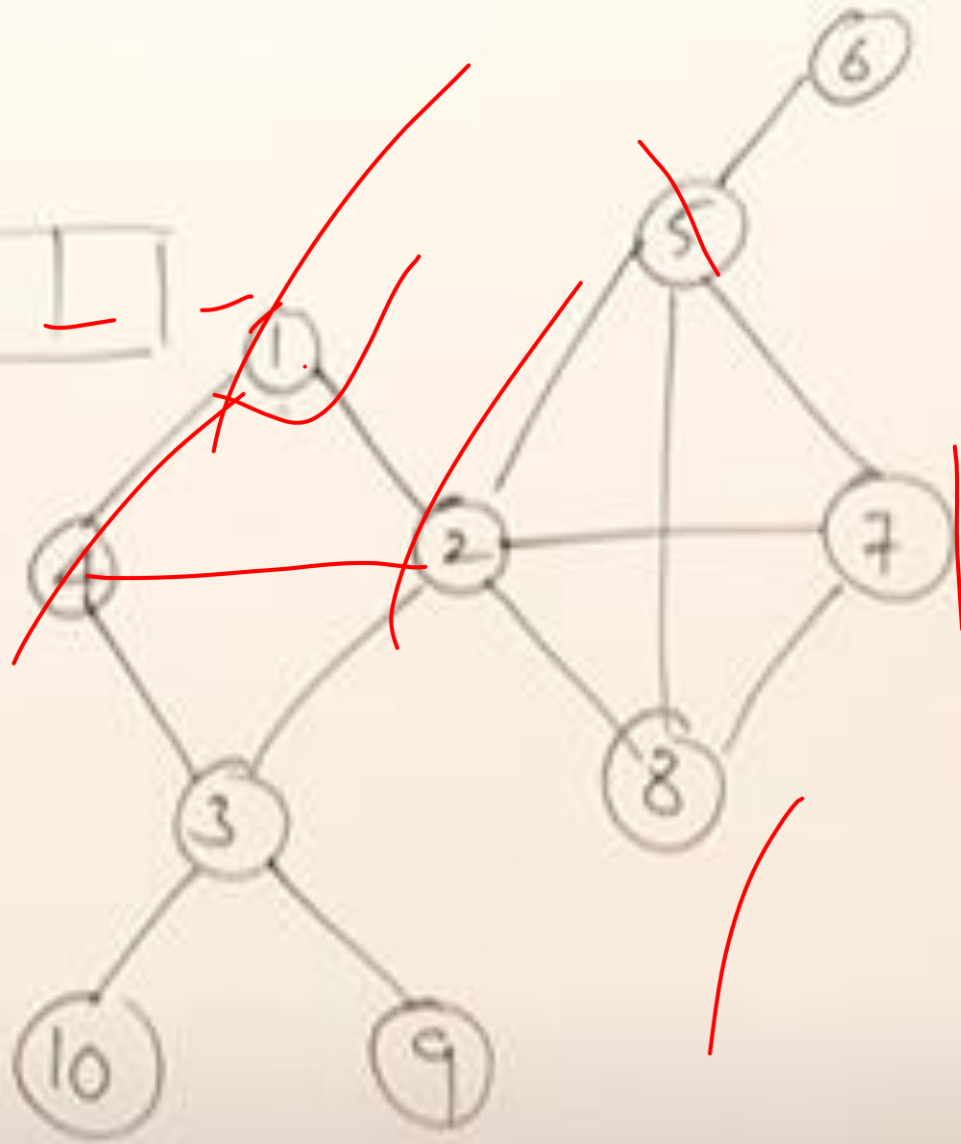
DFS: 1, 2, 3, 6, 7, 4, 5

BFS & DFS

BFS : 1

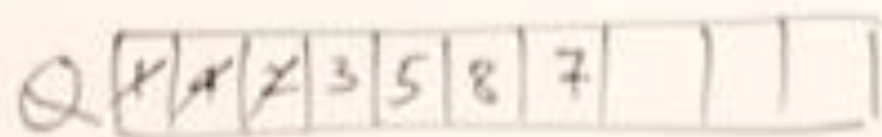


①



BFS & DFS

BFS: 1, 4, 2, 3, 5, 8, 7

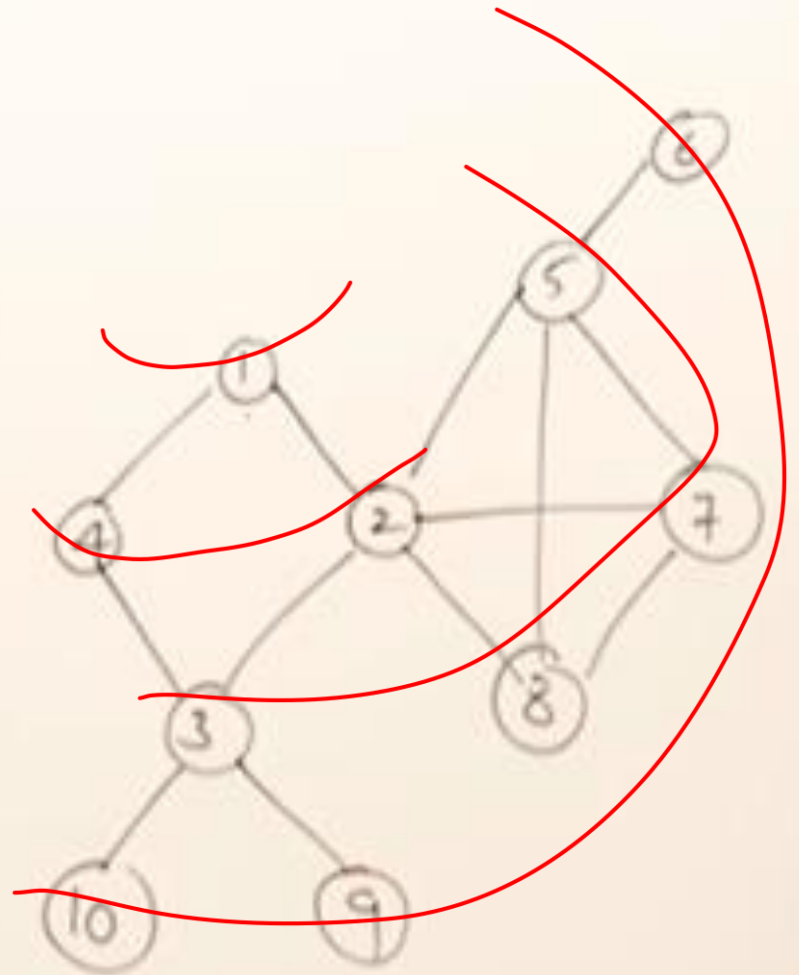
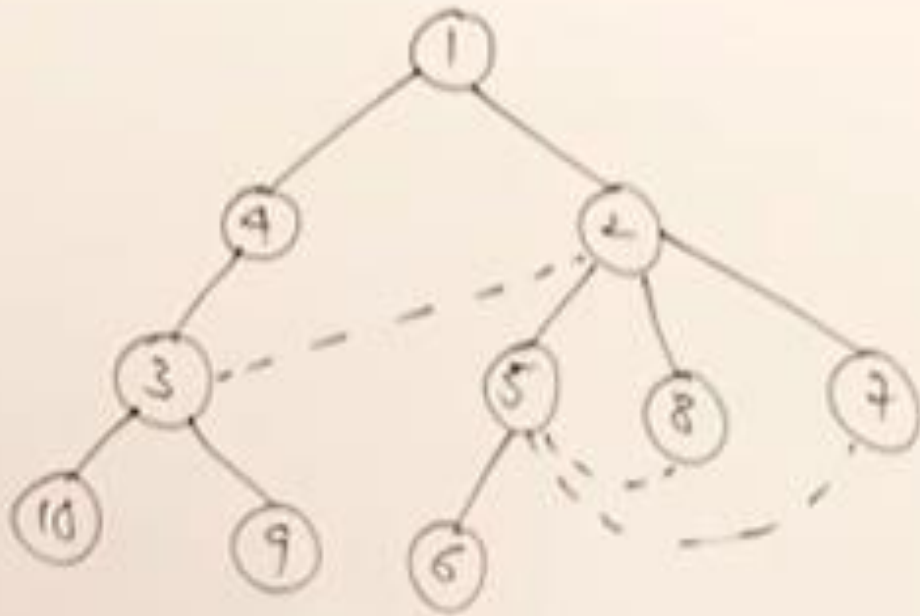


BFS & DFS

BFS : 1, 4, 2, 3, 5, 8, 7, 10, 9, 6

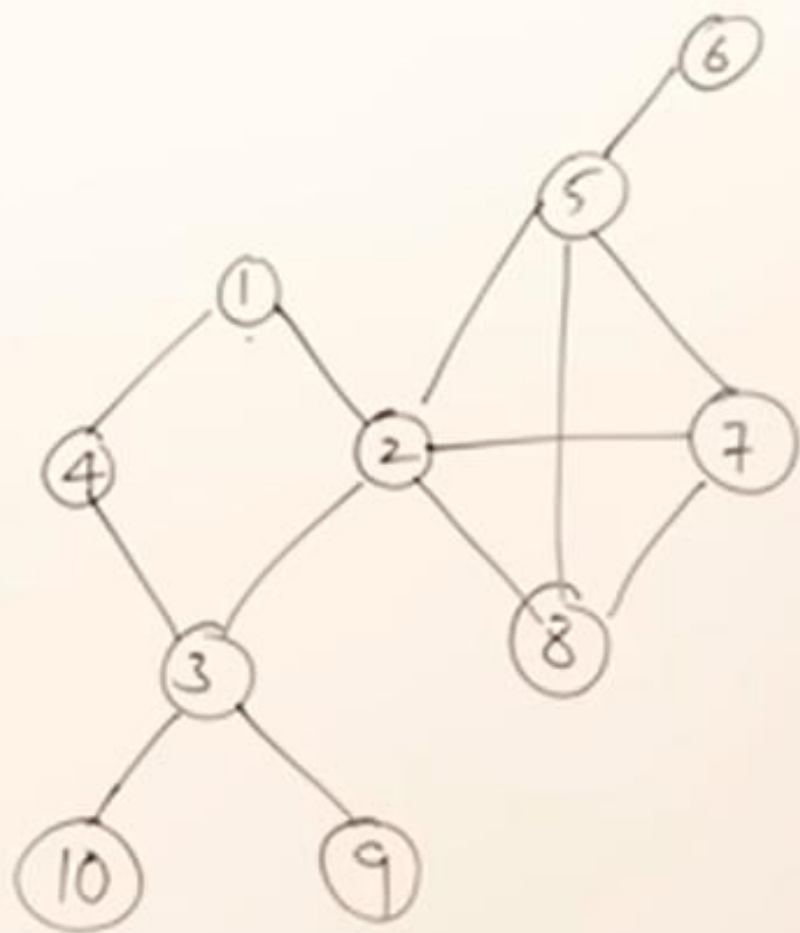
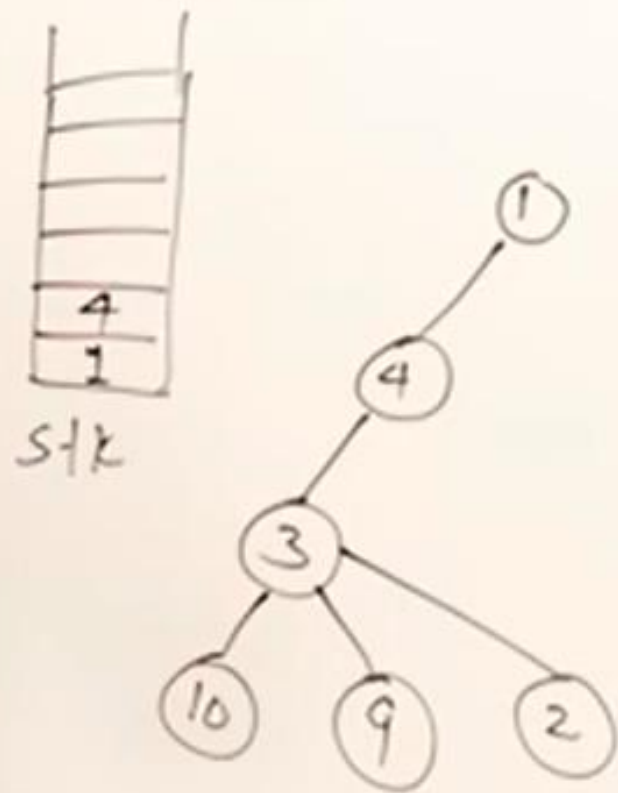
Q

1	4	2	3	5	8	7	10	9	6
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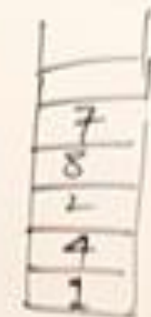
BFS & DFS

DFS: 1, 4, 3, 10, 9, 2

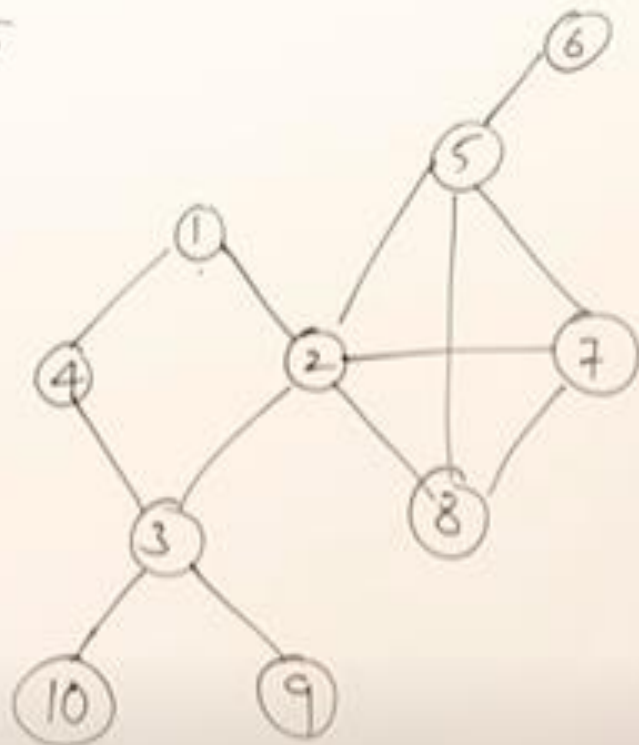
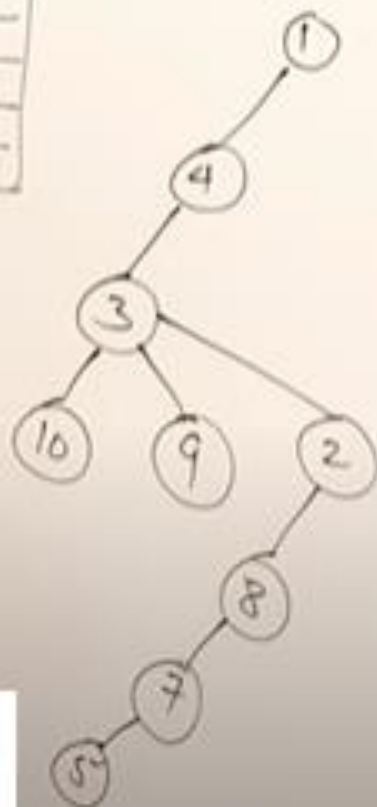


BFS & DFS

DFS: 1, 4, 3, 10, 9, 2, 8, 7, 5



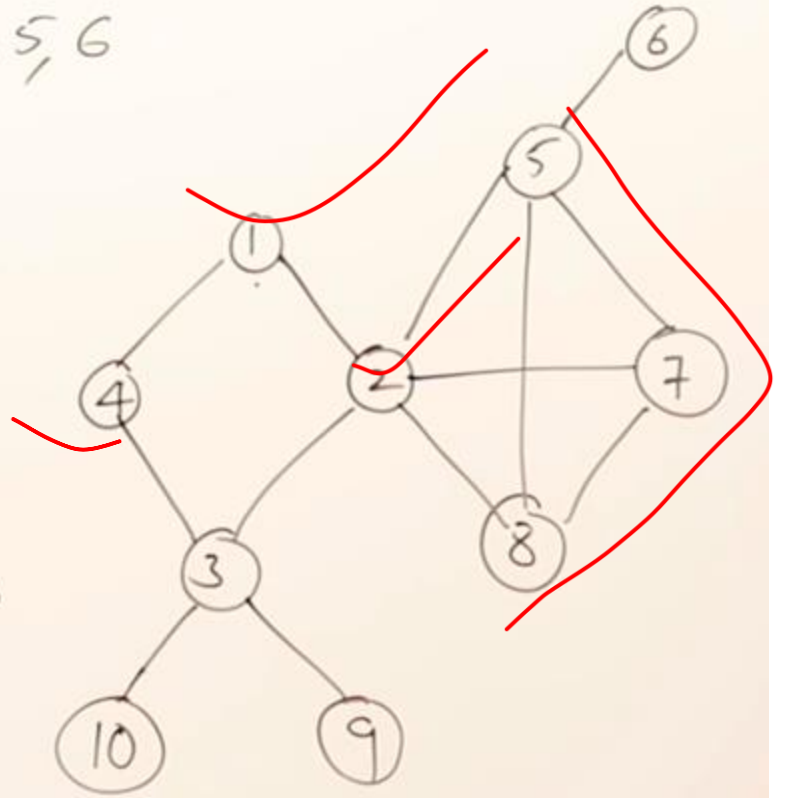
Stack

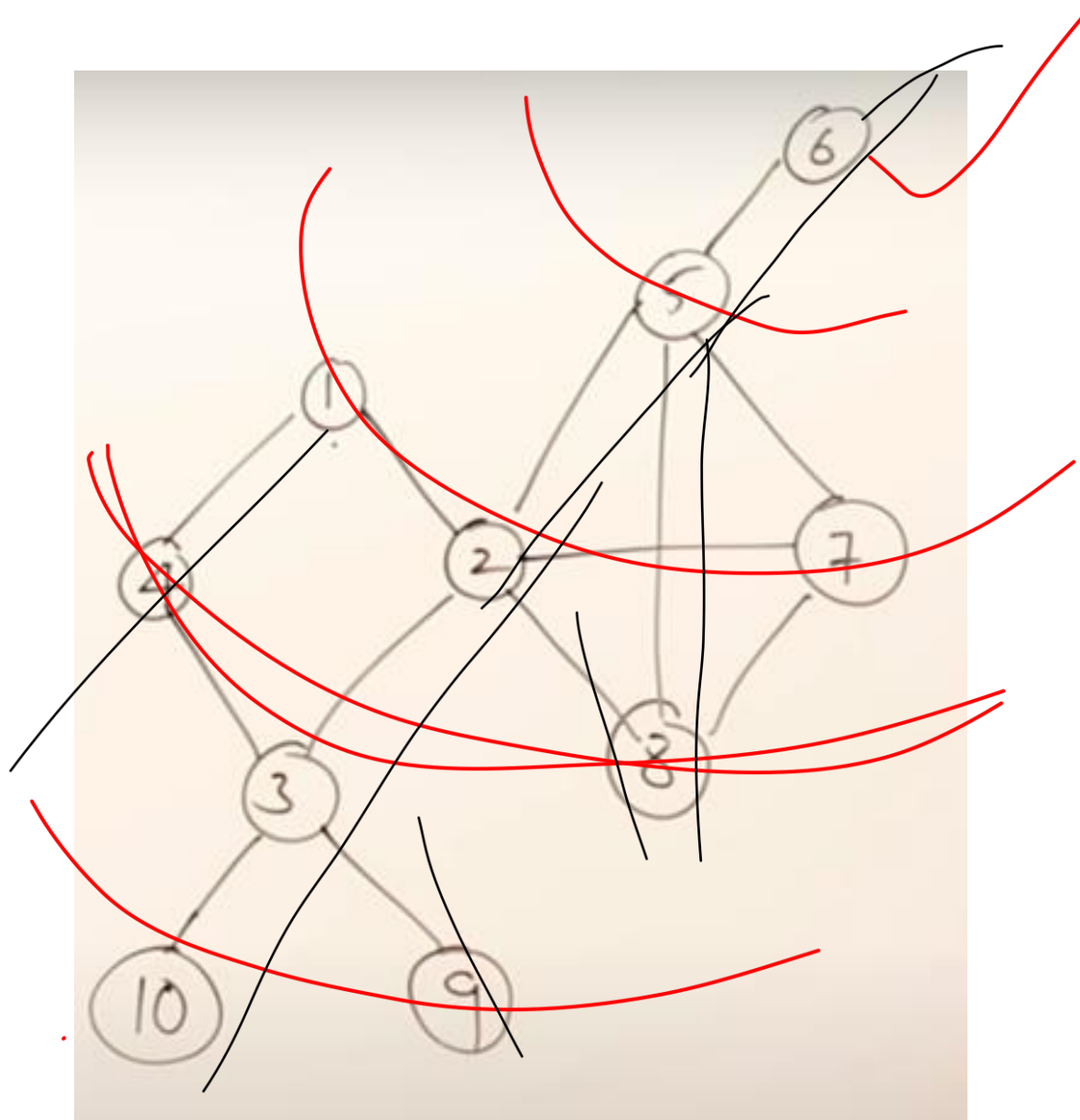


DFS & DFS

DFS: 1, 4, 3, 10, 9, 2, 8, 7, 5, 6

DFS spanning Tree





BFS & DFS

1) 1, 2, 8, 7, 5, 6, 3, 9, 10, 4,

2) 3, 4, 1, 2, 5, 6, 7, 8, 10, 9



Important differences between BFS and DFS

Sr. No.	Key	BFS	DFS
1	Definition	BFS, stands for Breadth First Search.	DFS, stands for Depth First Search.
2	Data structure	BFS uses Queue to find the shortest path.	DFS uses Stack to find the shortest path.
3	Source	BFS is better when target is closer to Source.	DFS is better when target is far from source.
4	Suitability for decision tree	As BFS considers all neighbour so it is not suitable for decision tree used in puzzle games.	DFS is more suitable for decision tree. As with one decision, we need to traverse further to augment the decision. If we reach the conclusion, we won.
5	Time Complexity	Time Complexity of BFS = $O(V+E)$ where V is vertices and E is edges.	Time Complexity of DFS is also $O(V+E)$ where V is vertices and E is edges.

Thank you