Tutorial - 5

Ans-1 **BFS** → It stands for Breath first search. It uses queue to find the shortest path. It is better when target is closer to source. It consider all neighbour so it is not suitable for decision tree used in Puzzel game. It is slower than DFS. TC → O(V+E).

DFS → It stands for Depth first search. It uses stack to find the shortest path. It is better when target is far from source. It is may suitable as with one decision. We need to traverse for further to argument the decision. It is faster than BFS. TC → O(V+E)

Ans-2 Stack is used to implement DFS, because it is we first traverse the whole branch of the tree and later on visit the adjacent branch, since this is similar to LIFO, therefore Stack is used.

Queue is used to implement BFS, it is because queue uses FIFO instead because BFS is to test the immediate children first and after all immidiate children are tested, to their return to those children & check their children & so forth.

Ans-3 **Sparse Graph** → Graph where number of edge is much less than the possible number of edges.

Dense Graph → Graph where number of edges is much more than close to maximal number of edges.

- if Graph is dense it should be represented by adjacy matrix.
- if Graph is sparse it should be represented by adjacy list.

Ans-4 BFS → In undirected graph, do a BFS traversal on given graph, for each visited vertex V, if the there is any adjacent 'a' such that 'V' is already visited & 'U' is not Parent of 'V' then there is Cycle in a graph.

DFS

Run DFS Brow that from a node and mark their node as visited now for any other vertices if its neighbour is already visited & that neighbour is not the Parent then there exist a cycle in graph.

Ans-5 Disjoint Set data Structure

The disjoint set can be defined as the sub set where there is no common element between two set operation are
1 Union, 2 make new set, 3 find

Ans-6 BFS

A → B → C → D → E

G → H → F

DFS

A → D → C → B

G → F → H

Ans-7 Connected component → 4, vertices → 10

Ans-8 Topological sort → 0 - 1 - 2 - 3 - 4 - 5, DFS: 5 → 2 → 1 → 3 → 0

Ans-9 Yes heap DS can be used to make Priority queue.

1 Dijkastra to find shortest path
2 Prim's algo
3 Hoffman algo

Ans-10 Min heap → root element is smaller
Max heap → root element is largest.