Tutorial 5

ues.

B.F.S (Breadth First Search)	D.F.S (Depth First Search)
1. B.F.S stands for Breadth ~~first~~ First Search is a algorithm used for level traversal of the graph	1. ~~2~~ D.F.S stands for Depth First Search is a algori-thm used in for ~~level~~ depth traversal for the graph
2. It is used for finding Minimal Spanning Tree (M.S.T) in the graph.	2. It is used for finding minimal spanning tree in the graph
3. Used for ~~q~~ ~~f~~ getting to destination near to source node.	3. Used for getting to a destination far from source node.
4. Uses ~~stack~~ queue data structure.	~~6~~ 4. ~~Used~~ Uses stack data structure.
5. ~~It~~ Used to find shortest distance in undirected graph.	5. Used ~~to find~~ in searching algorithms.

Ques^n 2^nd

Solution:

B.F.S uses queue data structure as we have to processes nearmost node intially and ~~B~~ in D.F.S we uses stack as we have to processes farthest most node first.

Ques^n 3rd -

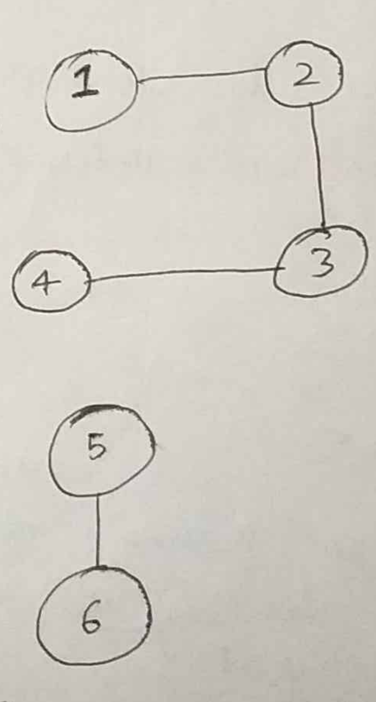
Dense graph is a graph in which edges are close to maximal number of edges - whereas sparse graph is a graph in which edges are near to minimum number of edges.

- Sparse graph can ~~be~~ have have disconnected edges.

Ques^n 4th -

We can detect cycle in graph using B.F.S and D.F.S by maintaining a parents list in which if a unvisited node try to visit a visited node it ~~signify~~ sinifies that graph has a cycle.

Ques^n 5th - ~~Dysoo~~ Disjoint set data structure is used for subgroup all connected an non connected node, it can also be used to detect cycle in ~~in~~ a graph.



Universal Set = $\{\cancel{1}, \cancel{2}, \cancel{3}, \cancel{4}, \cancel{5}, \cancel{6}\}$

edge(1,2)

$\{1, 2\} \Rightarrow S1$

edge(2,3) find 2 union set 1 and set $\{3\}$

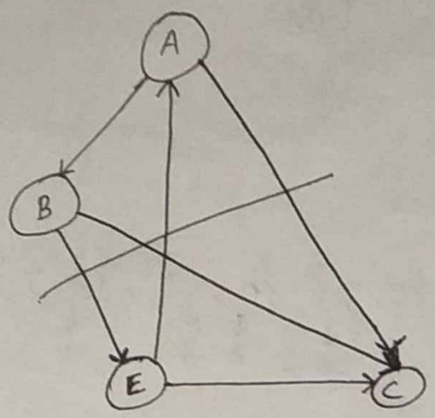
$\{1, 2, 3\}$

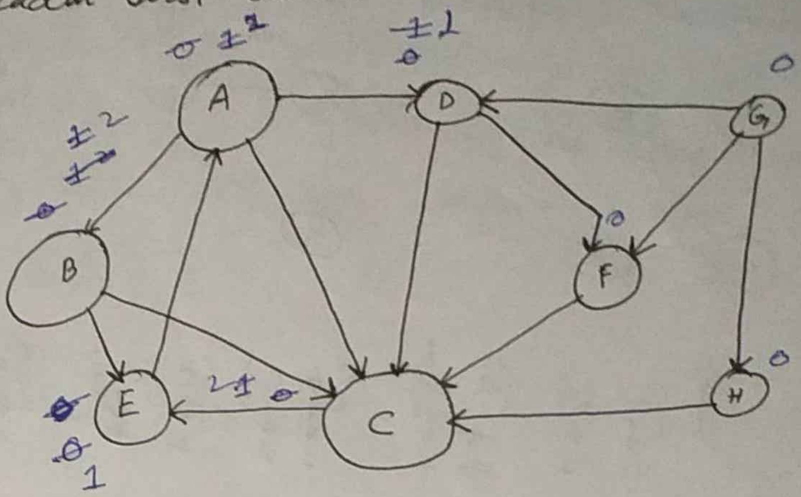
edge (3,4}) find(3) find(5,6)

$\{1, 2, 3, 4\}$ edge $\{5, 6\}$.

Ques 6th -

Breadth First Search



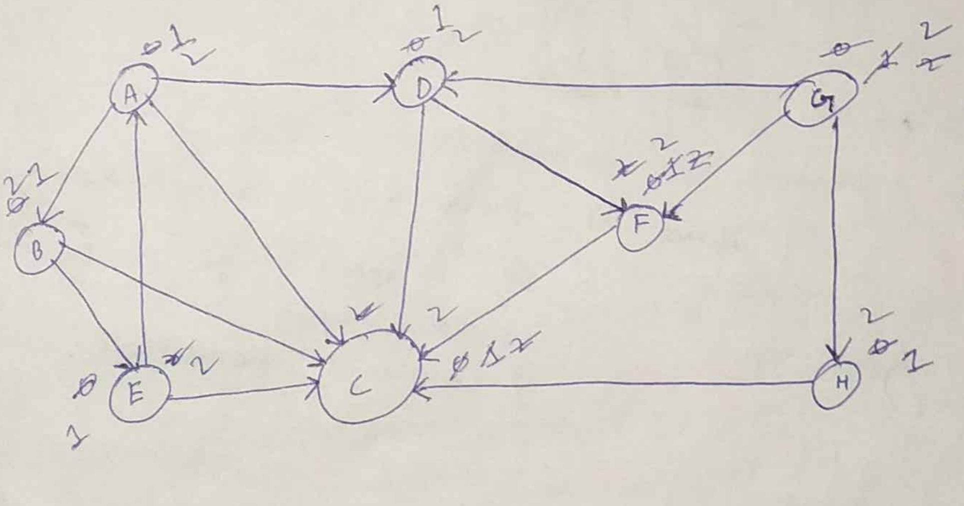


Queue	A	B	C	D	E	F	
Parent	×	A	A	A	B	D	

Visited nodes	A	B	C	D	E	F	

~~Ques 7th~~

Depth- First- Search



node Stack Visited node

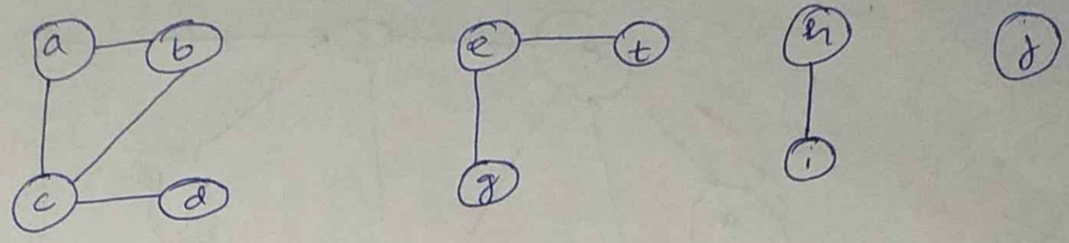
G GFCHEABDH

H DBAECFG

Ans.

Ques 7th -

Connected component using disjoint set data structure



$\{\{a, b\}, \{a, c\}, \{b, c\}, \{c, d\}, \{e, t\}, \{e, g\}, \{h, i\}, \{j\}\}$

$\{a,b\}$	$\{a,c\}$	$\{b,c\}$	$\{c,d\}$	$\{e,t\}$	$\{e,g\}$	$\{h,i\}$	$\{j\}$
0 1	~~2~~ 0 ~~3~~ 2	1 2	2 3	~~7~~ 4 5	5 ~~g~~ 6	7 8	9

0	1	2	3	4	5	6	7	8	9
0	~~1~~ 0	~~2~~ 0	~~3~~ 0	4	~~5~~ 4	~~6~~ 4	~~7~~ 7	~~8~~ 7	9

Universal Set

U = ~~0~~, 1, 2, 3, 4, 5, 6, 7, 8, 9

find ({0})

find ({1}) (Union) {0}, {1}

{{0, 1} find{2}

find 3

{0, 1, 2, 3}}

find ({j}) -

find{4}

~~Hence~~ as their are 3 representatives of graph hence it has 3 Connected component.

find{5}

Union ({4}, {5})

{4, 5}

find (6)

{(4, 5, 6)} = {(7, 8}

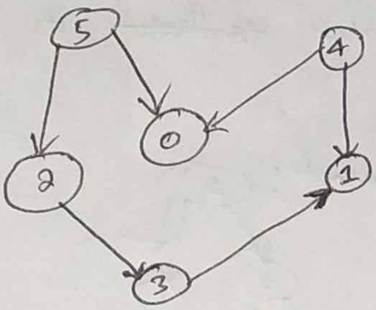
find ({7})

find ({8})

Union ({7}, {8})

Ques 8th :-

A type sorting that happens in Directed Acyclic graph DAG is a linear ordering of vertices such that edge {u,v} of two vertices ~~are~~ is ~~at~~ ~~haven~~ having vertices such that u come before v in ordering.



D.F.S = 5, 2, 3, 1, 0, 4

9. Heap data structure can be used to implement priority queue as ~~when~~ whenever we add value ~~use~~ ~~the~~ in heap data structure such as min heap or Max heap then it remains ~~to~~ in the configuration of ~~mean~~ ~~max~~ min heap ~~and~~ or max heap.

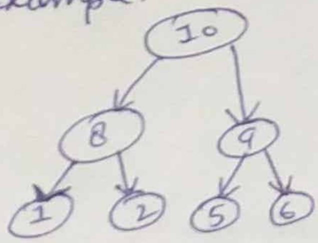
~~Dykast~~ Dykstra algorithm, ~~prims~~ ~~algorithm~~ Kruskal & algorithm can use priority queue as ~~it~~ ~~has~~ they have to ~~remain~~ ~~in~~ the use lowest value and ~~a~~ maintaining lowest value in the array ~~to~~ well make selection efficient.

Ques 10th :

Max heap

1. The man heap is a heap data structure in which root node will have greater value as compared to its ~~root~~ children

2. example:



Min heap

1. The ~~min~~ min heap is heap ~~data~~ ~~data~~ data structure Such that root node ~~to~~ ~~will~~ will ~~that~~ have lower value as compared to ~~them~~ its children

2. Example: