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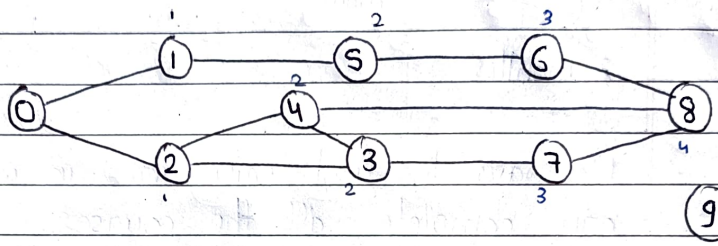
Day - 206

Graph - 10

* Shortest path in Undirected Graph:



⇉ We have to find the shortest distance a source node to all nodes.

⇉ we will use BFS.

⇉ So, we will start from 0.

⇉ Then, it will visit ① & ②.

⇉ So, it is 1 distance from 0.

⇉ Also, we will don't change ~~an~~ the distance of any visited node.

	0	1	2	3	4	5	6	7	8	9
distance	~~0~~	~~1~~	~~1~~	~~2~~	~~2~~	~~2~~	~~3~~	~~3~~	~~3~~	-1
visited	ϕ1	ϕ1	ϕ1	ϕ1	ϕ1	ϕ1	ϕ1	ϕ1	ϕ1	ϕ1
	0	1	2	3	4	5	6	7	8	9

⇉ we are starting from 0 and ~~to~~ put it into the queue.

0 ~~1~~ 2	→	2 5	→	5 3 4	...

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distance[neighbour] = distance[node] + 1;

⇒ When we use DFS, we will have to traverse more than 1 time.

⇒ This will increase our time complexity.

⇒ That's why DFS is not preferred for this question.

⇒ Now what if I have to give the path too.

Ex: path from 0 to 8.

⇒ 0 2 4 8

⇒ we can easily find the distance by using previous method.

⇒ So, for path, we have to store the info. of the parent.

⇒ This time, we will take two array parent and visited.

⇒ Always remember, those node that visit any node first time will be their parent.