

Stack
↖ ↗
Recursive

Problems On graph algorithms

↳ DFS → depth first search

↳ BFS → breadth first search

↙ ↘
Iteration Queue

} graph traversal

↳ visited nodes → data structure

↙
set

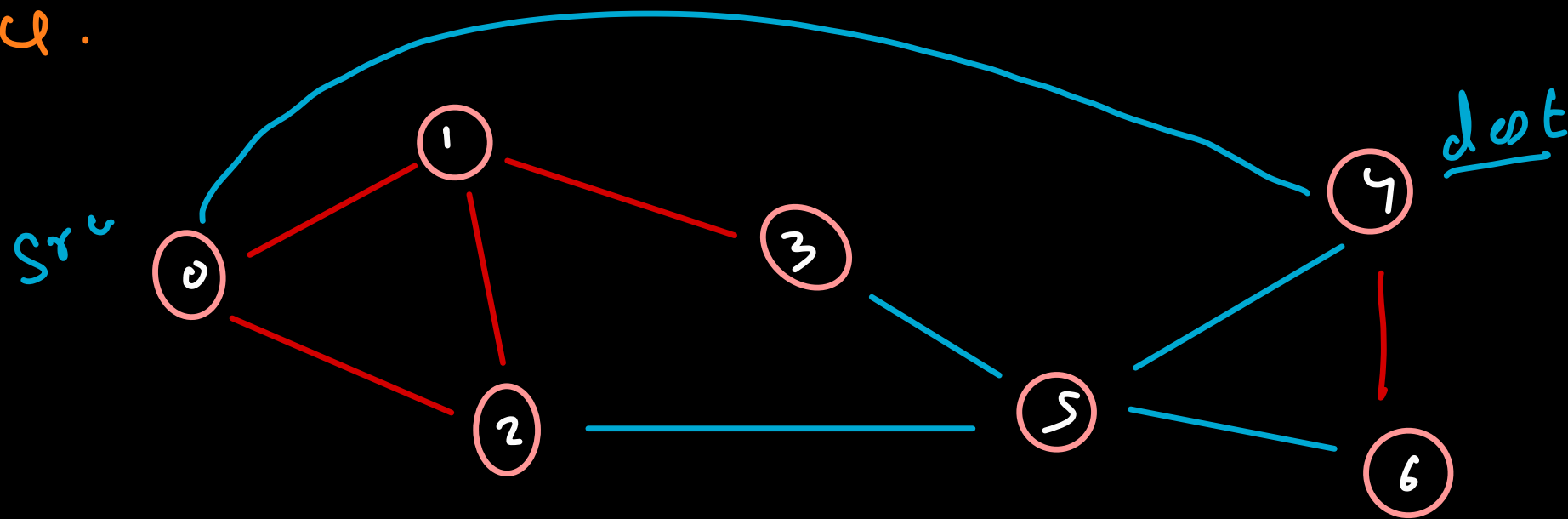
$O(V+E)$

Q Given an undirected, ^{un weighted} graph, with every edge having either RED or BLUE color. find the shortest distance between a given source and destination when:

(1) You have to start from a Red edge and end at a blue edge.

(2) No self loops or multiple edges

Ans (3) You can switch from a Red edge to blue edge only once.



attent 2

Brute force

how about we calculate all paths from source to destination

Dfs

Optimised

$\min(x, y, z)$

Src

R
R
R

i1
x

i2
y

i3
z

B
B
B

dest

switchy

Let's give all remaining nodes a choice to be the transitioning node.

SSSP \rightarrow single src shortest path \rightarrow bfs

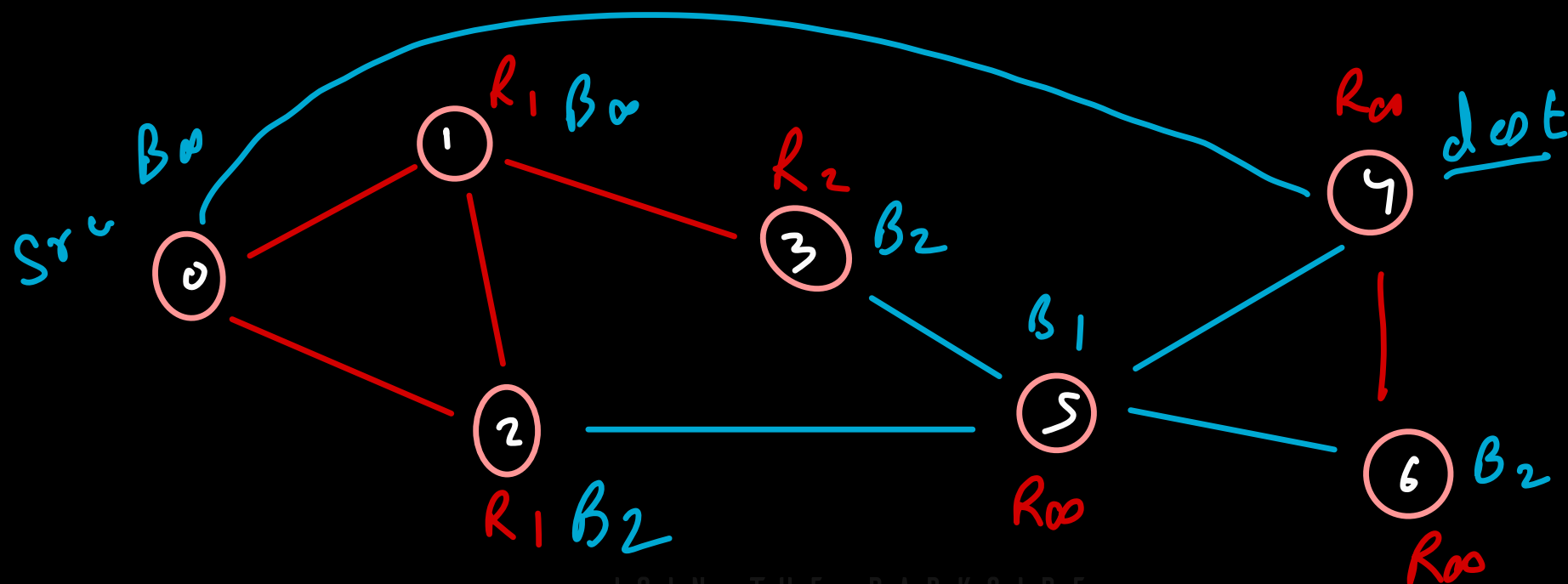
src \rightarrow i such that all edges are red

dest \rightarrow i such that all edges are blue

go to all the nodes $\rightarrow \min (\text{src-red}[i] + \text{dest-blue}[i])$

$\forall i \in V - \{\text{src}, \text{dest}\}$

2 BFS + \checkmark



$\delta_{\text{wtdy}} \rightarrow$

1	\rightarrow	∞
2	\rightarrow	3
3	\rightarrow	4
5	\rightarrow	∞
6	\rightarrow	∞

A large curly bracket groups the values 3, 4, ∞ , and ∞ . To the right of the bracket is the word "min". Further right, the number 3 is circled and underlined twice. To the right of the circled 3 is the text "via 2".

$O(V + E)$

$\underline{\underline{N}}$

