Breadth
First
Search

BFS

BFS Tree

DFS

$$2 \rightarrow 3 \rightarrow 6 \rightarrow 7 \rightarrow 8$$

$$4 \rightarrow 5$$
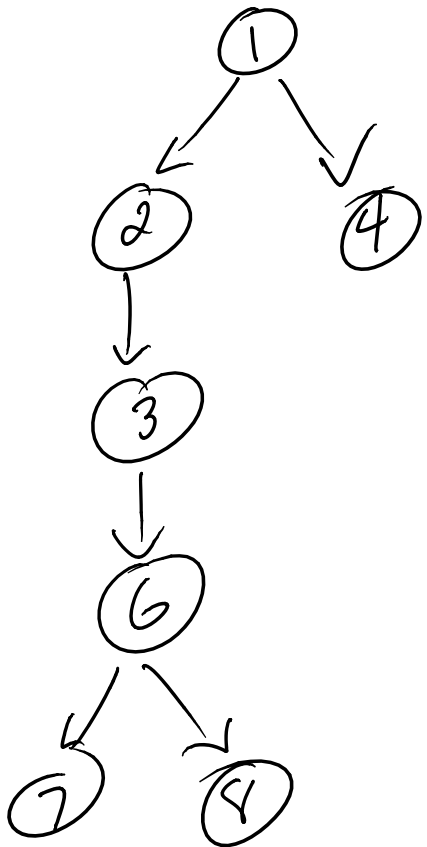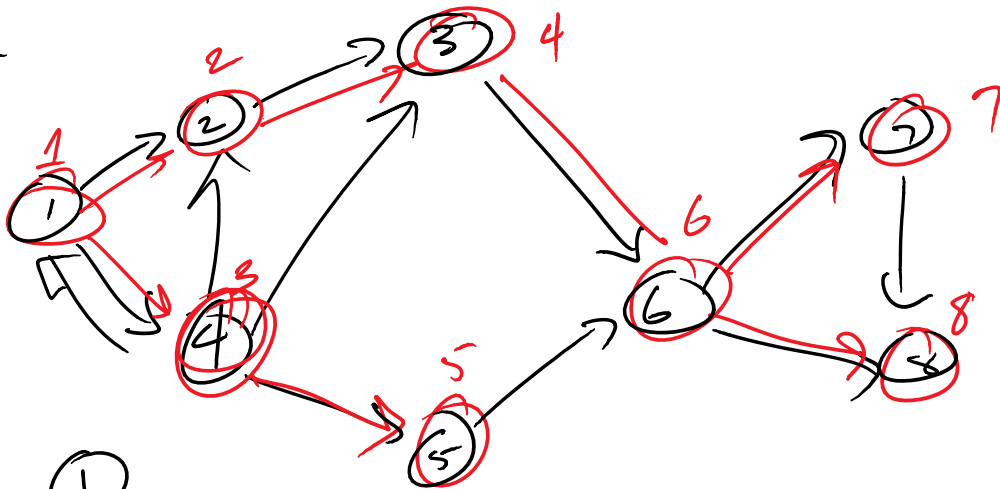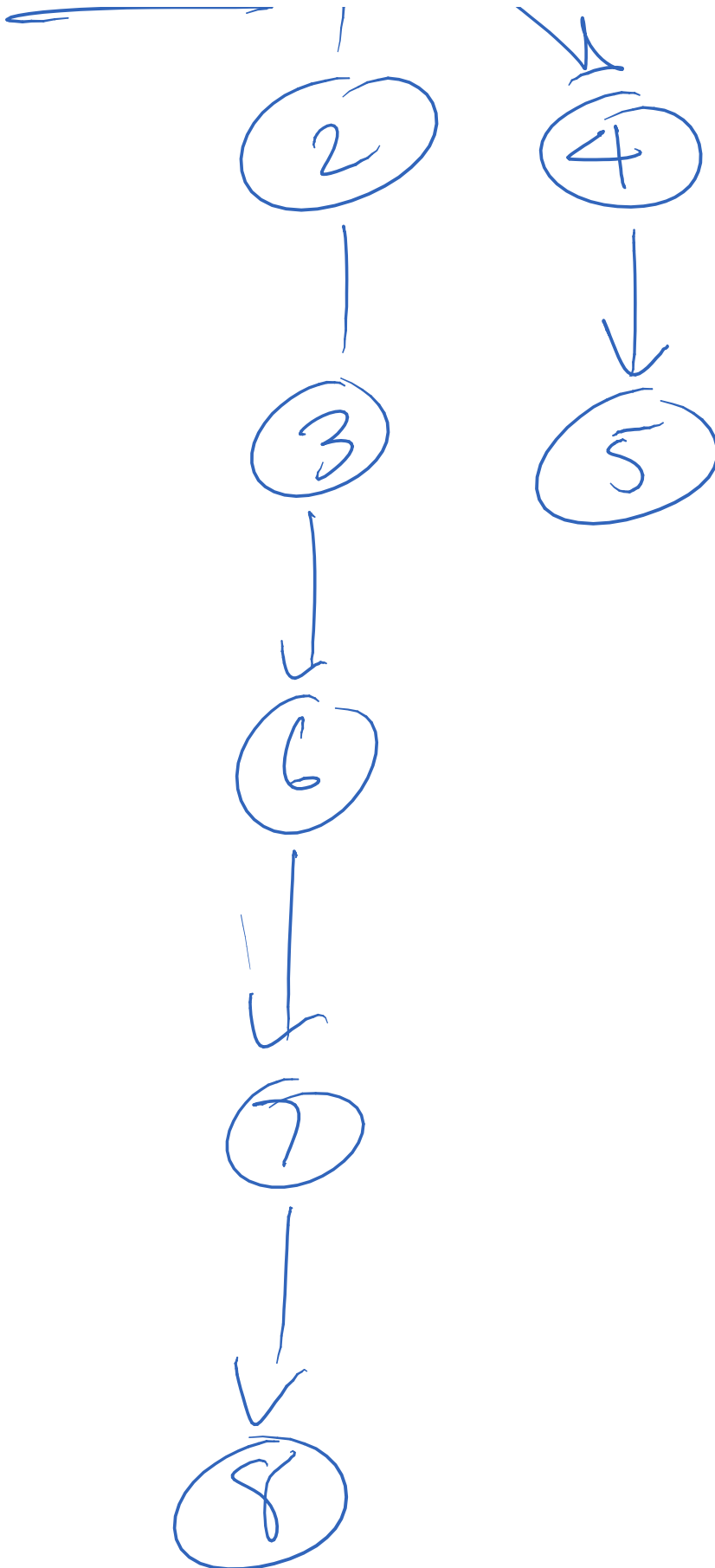
0 1 2 3 w

	0	1	2	3	w
0					
1					
2					
3					
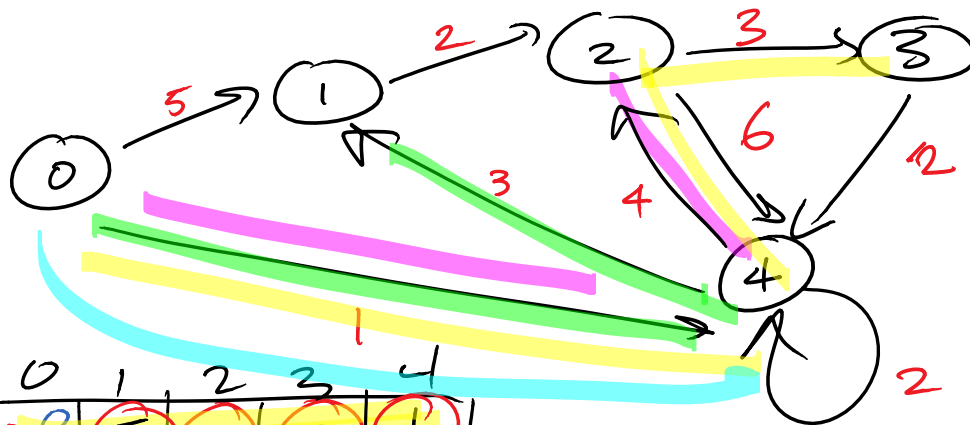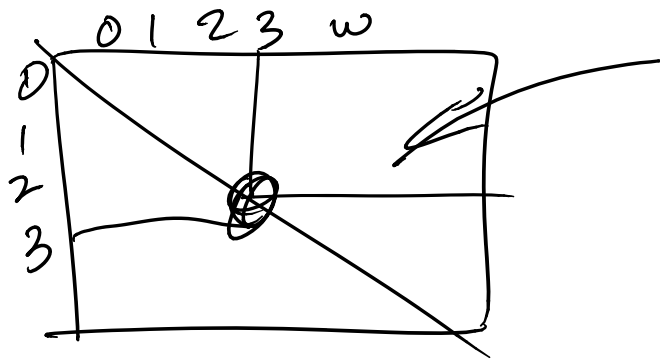
Shortest Path

$\text{source} \rightarrow \text{sink}$

	0	1	2	3	4
0	0	5	∞	∞	1
1	∞	0	2	∞	∞
2	∞	∞	0	3	6
3	∞	∞	∞	0	2
4	∞	3	4	∞	2

Dijkstra's Single Source Shortest Path Algorithm

$V = \{0, 1, 2, 3, 4\}$

S		D[1]	D[2]	D[3]	D[4]
{0}		5	∞	∞	1
{0,4}	4	4	5	∞	1
{0,4,1}	1	4	5	∞	1
{0,4,1,3}	2	4	5	8	1

V − S

$\{0,1,2,3\}$ ⊆ ∈ V —

	4	5	8	1

V

Greedy Algorithm —

We make a locally optimal decision leading to a global optimum

min cost edge

S → V−S