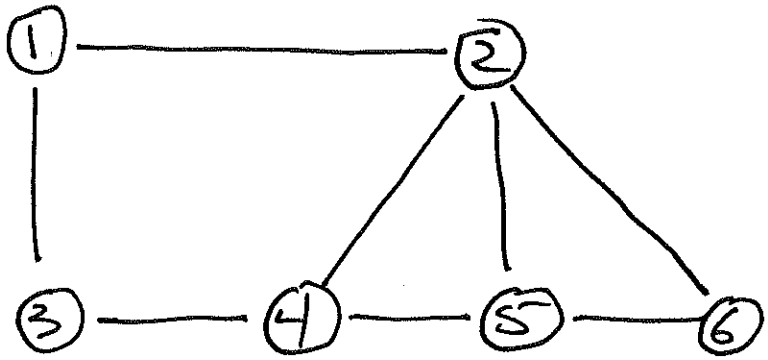
CSE 101 4-9-26

Ex. BFS : $\boxed{s=3}$



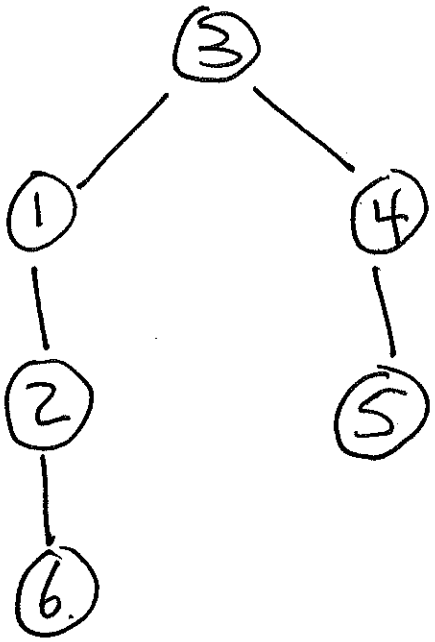
	Adj	Color	d	p
1	2, 3	~~w~~ ~~g~~ b	~~∞~~ 1	~~N~~ 3
2	1, 4, 5, 6	~~w~~ ~~g~~ b	~~∞~~ 2	~~N~~ 1
3	1, 4	~~g~~ b	0	N
4	2, 3, 5	~~w~~ ~~g~~ b	~~∞~~ 1	~~N~~ 3
5	2, 4, 6	~~w~~ ~~g~~ b	~~∞~~ 2	~~N~~ 4
6	2, 5	~~w~~ ~~g~~ b	~~∞~~ 3	~~N~~ 2

Q: ~~3~~ ~~1~~ ~~4~~ ~~2~~ ~~5~~ ~~6~~

Shortest paths tree:

or BFS Tree!

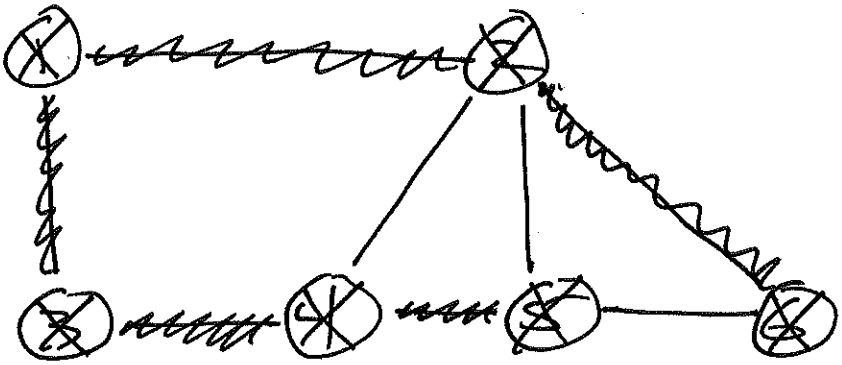
dist = depth



Also called Predecessor Subgraph

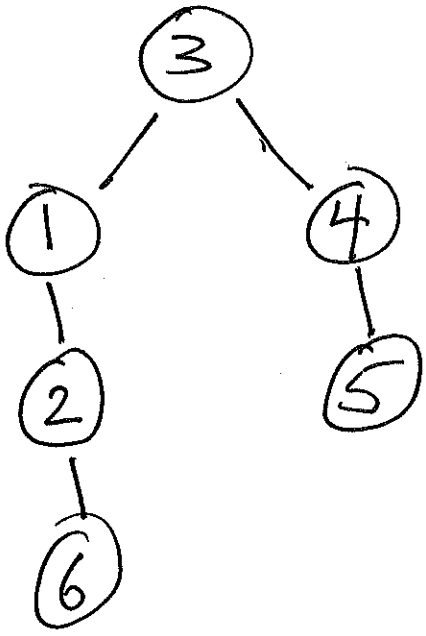
Ex. same (easy way)

s = 3



Q: 3, 1, 4, 2, 5, 6

BFS Tree:



dist
0
1
2
3

Defn.

The Predecessor Subg-aph is

$T = (V_p, E_p)$ where

$$V_p = \{ x \in V(G) \mid P[x] \neq nil \} \cup \{s\}$$

$$E_p = \{ (P[x], x) \mid P[x] \neq nil \}$$

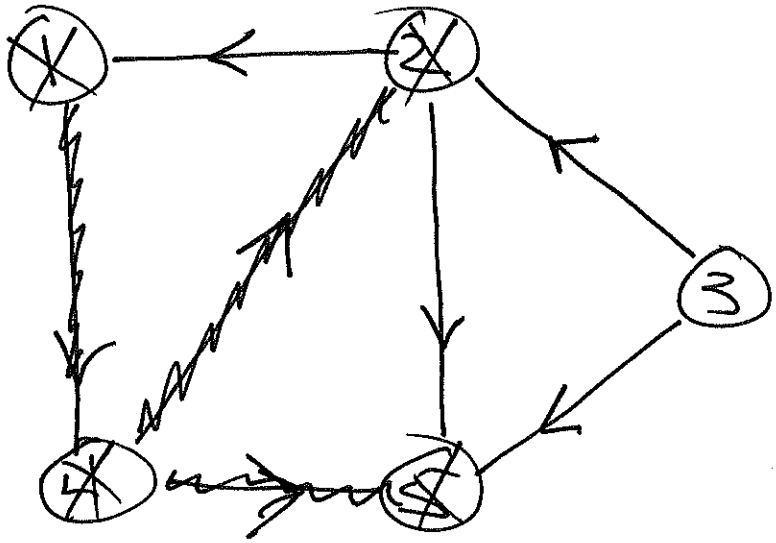
- ordered pair if directed
- unordered $\{P[x], x\}$ if undirected

Note: $\overline{T}$ is acyclic

- $M = n - 1$

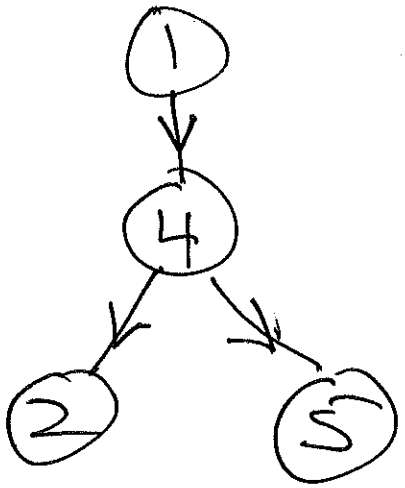
$\Rightarrow \overline{T}$ is a tree!

Ex. (directed) $s = 1$



Q: 1 4 2 5

BFS Tree



dist
0
1
2