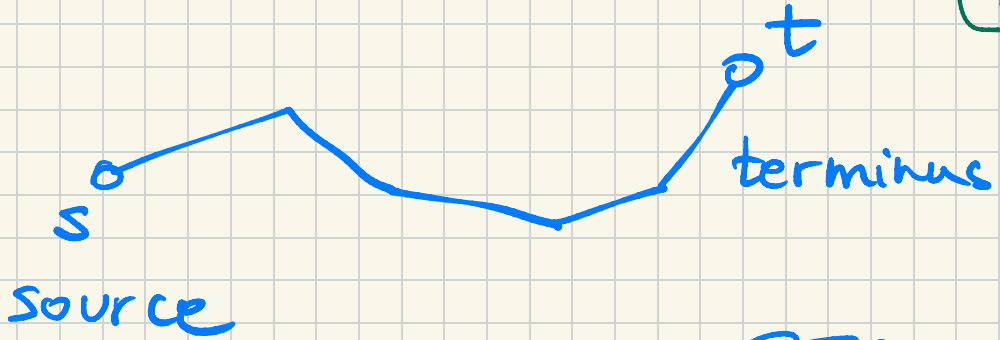


HONORS
ALGORITHMS

2025-02-03

2025-02-03

$Lp1$

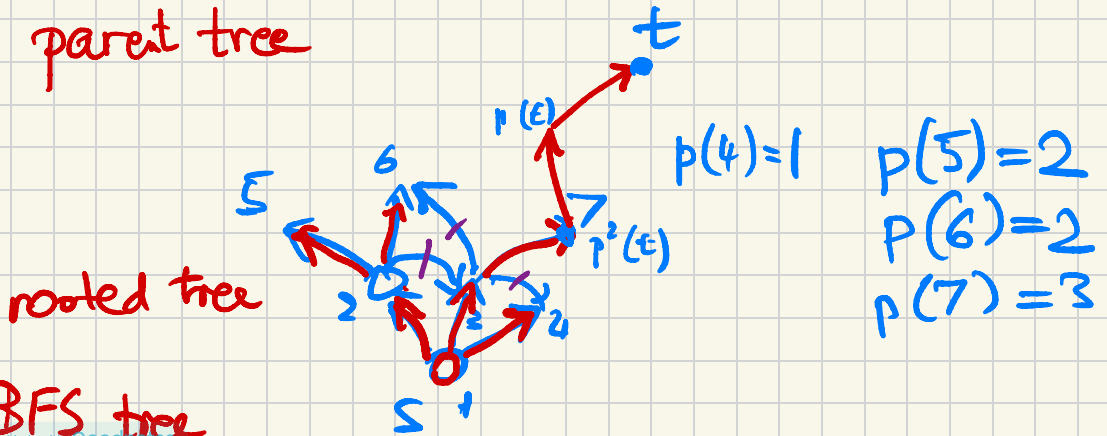


s-t path

BFS algorithm

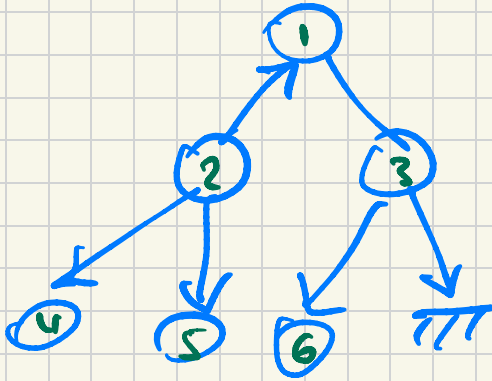
SINGLE-SOURCE SHORTEST PATH problem

parent tree



BFS tree

Distression: HEAPS



$$p(6) = 3$$

$$p(5) = 2$$

$$p(4) = 2$$

$$p(3) = 1$$

$$p(2) = 1$$

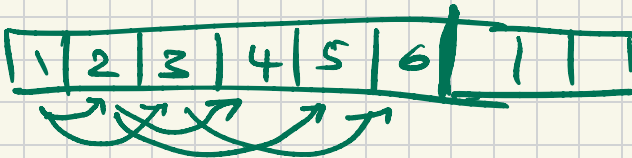
ARRAY REPRESENTATION OF A HEAP

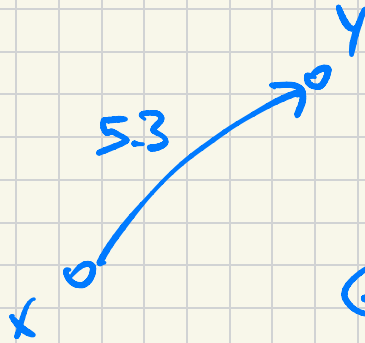
$$p(k) = \left\lfloor \frac{k}{2} \right\rfloor$$

$$lc(k) = 2k$$

← left child

$$rc(k) = 2k + 1$$

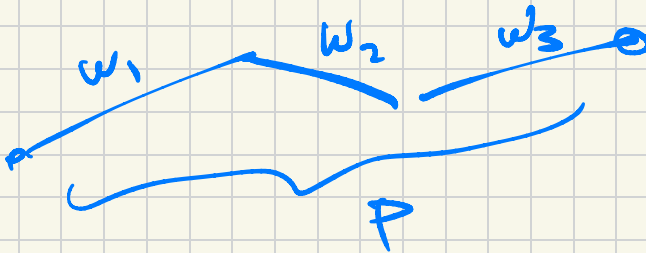




digraph
 $G = (V, E)$
 $E \subseteq V \times V$

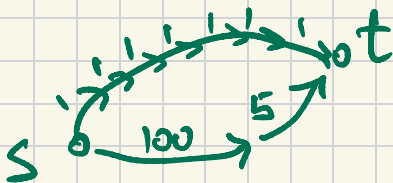
weighted digraph
 (V, E, w)

$$w: E \rightarrow \mathbb{R}$$



$$w(P) = \sum w_i$$

weighted distance : $\sum$ weights
 combinatorial " : $\#$ steps



solves: single source
shortest weighted path
assuming $(\forall e \in E)(w(e) \geq 0)$

