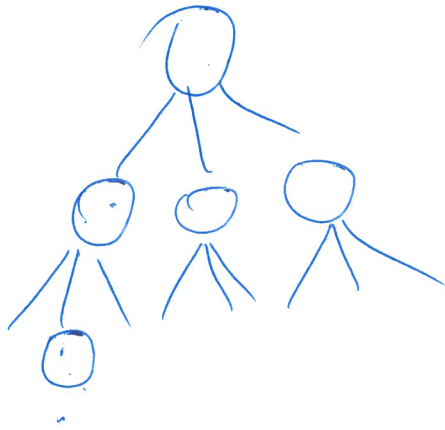


CS5811  
 9/2/2016  
 Friday

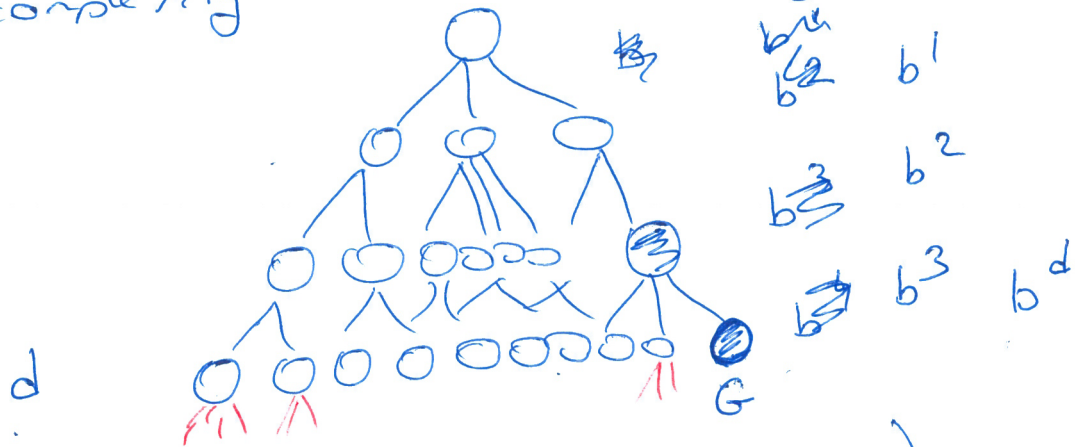
①



BFS

DFS

time complexity

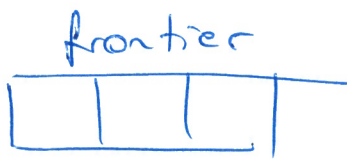


$$O(b^d + b^{d-1} + b^{d-2} + \dots + b^0)$$

$$O(b^d)$$

$$O(b^{d+1})$$

worst case  
 time complexity



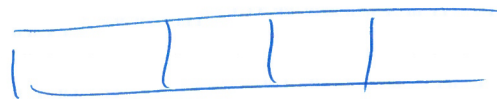
(2)



maximum number of nodes in  
frontier at any point during search.



$b^1$



$b^2$

$b^d$

$b^d$

$\pi$

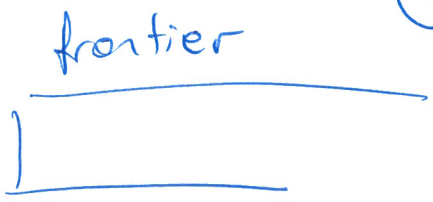
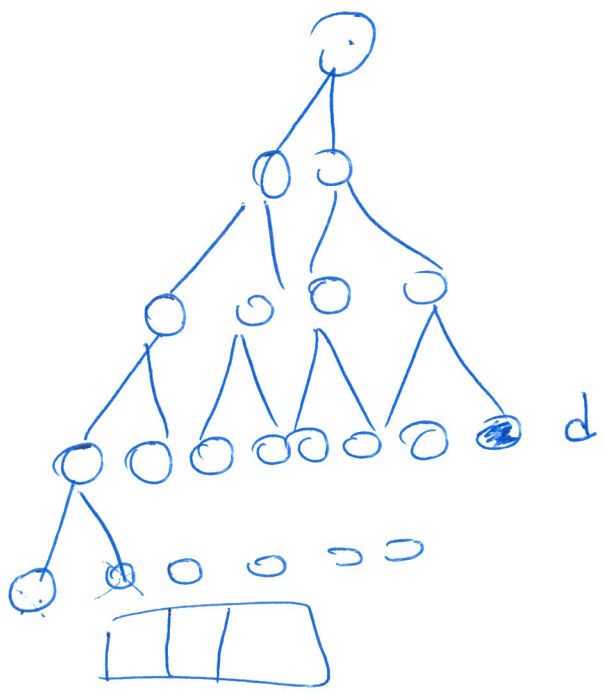
$b^{(d+1)}$

idk

$b^d$  or  $b^{(d+1)}$

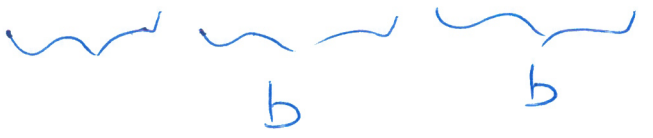
$b^d - 1$

b



$d+1$   
 $d$   
 $b^{d-1}$   
 $b^{d+1}-1$

m



$bm$  space complexity  
 ↓  
 for DFS  
 maximum depth of the tree

completeness

If a solution exists, will it be found?

DFS

BFS

no for  $m = \infty$

yes

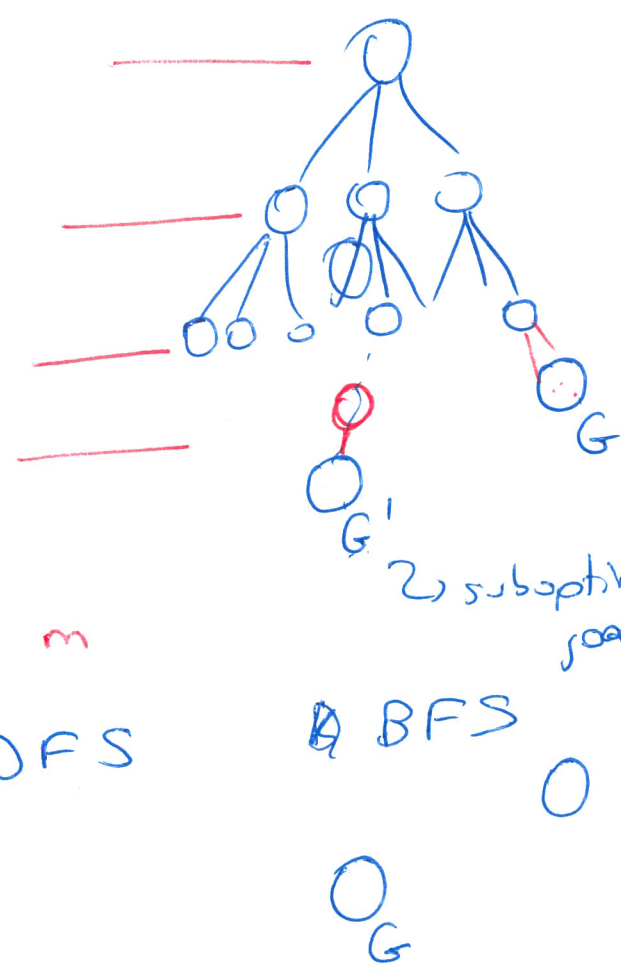
↳ can put a depth limit

optimality

Is the algorithm guaranteed to find the optimal (least cost) solution?

DFS

BFS



→ optimal goal  
 $cost(G) < cost(G')$   
 $depth(G) < depth(G')$

↳ suboptimal goal

m  
 DFS

BFS

G G'

G  
 G'