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CS462

I.

Algorithm	Time Complexity	Space Complexity	Complete?	Optimal?
BFS	O(b^d)	O(b^d)	YES	Only on unweighted graph.
UCS	$O(b^{C/e})$	$O(b^{C/e})$	YES (If costs are positive integers)	YES
DFS	O(b^n)	O(bn)	No	NO
DLS	O(b^l)	O(bl)	NO	NO
IDS	O(b^d)	O(bd)	Only when branching factor is finite.	Only on unweighted graph.
A*	O(b^d)	O(b^d)	YES	YES (When heuristic underestimates)

Sources:

i. Lecture slides.
ii. https://mhesham.wordpress.com/tag/uniform-cost-search/

II.

Initial state
S =

6		2
1	4	3
7	5	8

$$h(S) = \sum_{y=0}^{2} \sum_{x=0}^{2} Manhattan(S_{y,x}) = 9$$

Algorithm	# of states generated
BFS	1250
DFS	205287
DLDFS L = 12	1737
IDDFS	4673
A*	32