Ned Azar

cs462

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| **Algorithm** | **Time Complexity** | **Space Complexity** | **Complete?** | **Optimal?** |
| BFS | O(b^d) | O(b^d) | YES | Only on unweighted graph. |
| UCS | *O*(bC/*e*) | *O*(bC/*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:

1. Lecture slides.
2. <https://mhesham.wordpress.com/tag/uniform-cost-search/>

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Initial state

S =

|  |  |  |
| --- | --- | --- |
| 6 |  | 2 |
| 1 | 4 | 3 |
| 7 | 5 | 8 |

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