BFS

|  |  |  |  |
| --- | --- | --- | --- |
| (x1,y1) to (x2,y2) | No. of goal tests(time complexity) | Max frontier(space complexity) | Path length |
| (1,1) to ( 4,4) | 16 | 9 | 3 |
| (1,1) to (2,5) | 18 | 9 | 4 |
| (1,20) to (20,1) | 270 | 22 | 33 |
| (13,6) to (7,6) | 247 | 22 | 28 |
| (13,8) to (11,19) | 150 | 13 | 22 |

DFS

|  |  |  |  |
| --- | --- | --- | --- |
| (x1,y1) to (x2,y2) | No. of goal tests(time complexity) | Max frontier(space complexity) | Path length |
| (1,1) to ( 4,4) | 4 | 7 | 3 |
| (1,1) to (2,5) | 263 | 84 | 6 |
| (1,20) to (20,1) | 212 | 99 | 46 |
| (13,6) to (7,6) | 158 | 91 | 68 |
| (13,8) to (11,19) | 138 | 89 | 50 |

GBFS

|  |  |  |  |
| --- | --- | --- | --- |
| (x1,y1) to (x2,y2) | No. of goal tests(time complexity) | Max frontier(space complexity) | Path length |
| (1,1) to ( 4,4) | 4 | 7 | 3 |
| (1,1) to ( 2,5) | 5 | 9 | 4 |
| (1,20) to (20,1) | 64 | 51 | 47 |
| (13,6) to (7,6) | 41 | 35 | 28 |
| (13,8) to (11,19) | 29 | 30 | 22 |

Fastest algorithm

From the data listed above, greedy best first search finds the solution in the shortest number of iterations

Smallest maximum frontier size

Although DFS has the minimum worst case space complexity, for narrow graphs like the one given, BFS and GBFS perform better WRT space complexity.

BFS and GBFS also generate comparable path lengths, unlike DFS, which has a large path length.

The results found are different from the theoretical analysis of worst case bounds, especially WRT DFS. This is because the graph is narrow, but deep.

BFS always finds the shortest path.

GBFS doesn’t always go straight to the goal. In the 4th case , where the source and the destination are on opposite ends of the ‘A’ in the graph, it doesn’t account for this barrier in between.