

Red = robot

green = goal

Shaded = obstacles

Best First Search

Manhattan Distance ~~##~~- Report Fringe (include $f(N)$ values) in order of being added to Fringe

- Report order of nodes being expanded

- Report Final Path

$$BFS = f(N) = h(N)$$

 $h(N)$ = cost of path from N to goal Node

$$A^* = f(N) = g(N) + h(N)$$

 $g(N)$ = cost from init. to N

5	1,5	2,5	3,5	4,5	5,5	6,5	7,5	8,5	9,5
4	1,4	X	X	4,4	X	X	2,4	X	9,4
3	1,3	X	X	4,3	5,3	6,3	7,3	8,3	9,3
2	1,2	2,2	X	X	X	X	X	X	9,2
1	1,1	2,1	3,1	4,1	5,1	6,1	7,1	8,1	9,1
	1	2	3	4	5	6	7	8	9

 $h(N)$

$$D2 = |7-2| + |4-2| = 7$$

$$D1 = |7-1| + |4-2| = 8$$

$$E2 = |7-2| + |4-1| = 8$$

$$E1 = |7-1| + |4-1| = 9$$

$$C1 = |7-1| + |4-3| = 7$$

$$B1 = |7-1| + |4-4| = 6$$

$$A1 = |7-1| + |4-5| = 7$$

$$A2 = |7-2| + |4-5| = 6$$

$$A3 = |7-3| + |4-5| = 5$$

$$A4 = |7-4| + |4-5| = 4$$

$$A5 = |7-5| + |4-5| = 3$$

$$B4 = |7-4| + |4-4| = 3$$

$$A6 = |7-6| + |4-5| = 2$$

$$A7 = |7-7| + |4-5| = 1$$

$$A8 = |7-8| + |4-5| = 2$$

$$B7 = |7-7| + |4-4| = 0$$

$$D2 = (|7-2| + |4-2|) + (|2-2| + |2-2|) = 7$$

$$D1 = (|7-1| + |4-2|) + (|2-1| + |2-2|) = 9$$

$$E2 = (|7-2| + |4-1|) + (|2-2| + |2-1|) = 9$$

$$E1 = 9 + |2-1| + |2-1| = 11$$

$$C1 = 7 + |2-1| + |2-3| = 9$$

$$B1 = 6 + |2-1| + |2-4| = 9$$

$$A1 = 7 + |2-1| + |2-5| = 11$$

$$E3 = (|7-3| + |4-1|) + (|2-3| + |2-1|) = 9$$

$$E4 = |7-4| + |4-1| + |2-4| + |2-1| = 9$$

$$E5 = |7-5| + |4-1| + |2-5| + |2-1| = 9$$

$$E6 = |7-6| + |4-1| + |2-6| + |2-1| = 9$$

$$E7 = |7-7| + |4-1| + |2-7| + |2-1| = 9$$

$$E8 = |7-8| + |4-1| + |2-8| + |2-1| = 11$$

$$A2 = 6 + |2-2| + |2-5| = 9$$

$$A3 = 5 + |2-3| + |2-5| = 9$$

$$A4 = 4 + |2-4| + |2-5| = 9$$

$$A5 = 3 + |2-5| + |2-5| = 9$$

$$B4 = 3 + |2-4| + |2-4| = 7$$

$$C4 = |7-4| + |4-3| + |2-4| + |2-3| = 7$$

$$C5 = |7-5| + |4-3| + |2-5| + |2-3| = 7$$

$$C6 = |7-6| + |4-3| + |2-6| + |2-3| = 7$$

$$C7 = |7-7| + |4-3| + |2-7| + |2-3| = 7$$

$$C8 = |7-8| + |4-3| + |2-8| + |2-3| = 9$$

$$B7 = |7-7| + |4-4| + |2-7| + |2-4| = 7$$