1. Identify current and goal nodes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 |
| 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 |
| 19 | 20 | 21 | 22 | 23 | 24 |
| 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 |
| 37 | 38 | 39 | 40 | 41 | 42 |

1. Heuristic values (each node to goal), except impassable nodes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9 | 2  8 | 3  7 | 4  6 | 5  5 | 6  6 |
| 7  8 | 8  7 | 9  6 | 10  5 | 11  4 | 12  5 |
| 13  7 | 14 | 15  5 | 16 | 17  3 | 18  4 |
| 19  6 | 20  5 | 21  4 | 22  3 | 23  2 | 24  3 |
| 25  5 | 26 | 27  3 | 28 | 29  1 | 30  2 |
| 31  4 | 32  3 | 33  2 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. G value (movement cost) 🡺 Horizontal/vertical 10, diagonal 14. Values are totally personal from current to new node (0 + 14 = 14).

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9 | 2  8 | 3  7 | 4  6 | 5  5 | 6  6 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5 | 11  4 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3 | 18  4 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3 | 23  2 | 24  3 |
| 25  5 | 26 | 27  3 | 28 | 29  1 | 30  2 |
| 31  4 | 32  3 | 33  2 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Define open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14

Open list: #7, #8, #9, #13, #15, #19, #20, #21.

1. F Values (H + G) 🡺 always interested in smallest F value in the neighborhood.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9 | 2  8 | 3  7 | 4  6 | 5  5 | 6  6 |
| 7  8  14  22 | 8  7  10  17 | 9  6  14  20 | 10  5 | 11  4 | 12  5 |
| 13  7  10  17 | 14 | 15  5  10  15 | 16 | 17  3 | 18  4 |
| 19  6  14  20 | 20  5  10  15 | 21  4  14  18 | 22  3 | 23  2 | 24  3 |
| 25  5 | 26 | 27  3 | 28 | 29  1 | 30  2 |
| 31  4 | 32  3 | 33  2 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Move to node with less F value. If F values are same 🡪 look for less H values, if H values are same 🡪 Random, either #15 or #20

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9 | 2  8 | 3  7 | 4  6 | 5  5 | 6  6 |
| 7  8  14  22 | 8  7  10  17 | 9  6  14  20 | 10  5 | 11  4 | 12  5 |
| 13  7  10  17 | 14 | 15  5  10 | 16 | 17  3 | 18  4 |
| 19  6  14  20 | 20  5  10  15 | 21  4  14  18 | 22  3 | 23  2 | 24  3 |
| 25  5 | 26 | 27  3 | 28 | 29  1 | 30  2 |
| 31  4 | 32  3 | 33  2 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15

Open list: #7, #8, #9, #10, #13, #19, #20, #21, #22.

1. Update G and F values ONLY for newly added nodes to the open list.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9 | 2  8 | 3  7 | 4  6 | 5  5 | 6  6 |
| 7  8  14  22 | 8  7  10  17 | 9  6  14  20 | 10  5  24  29 | 11  4 | 12  5 |
| 13  7  10  17 | 14 | 15  5  10 | 16 | 17  3 | 18  4 |
| 19  6  14  20 | 20  5  10  15 | 21  4  14  18 | 22  3  24  27 | 23  2 | 24  3 |
| 25  5 | 26 | 27  3 | 28 | 29  1 | 30  2 |
| 31  4 | 32  3 | 33  2 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Move to node with less F value in the whole map 🡪 #20

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9 | 2  8 | 3  7 | 4  6 | 5  5 | 6  6 |
| 7  8  14  22 | 8  7  10  17 | 9  6  14  20 | 10  5  24  29 | 11  4 | 12  5 |
| 13  7  10  17 | 14 | 15  5  10 | 16 | 17  3 | 18  4 |
| 19  6  14  20 | 20  5  10  15 | 21  4  14  18 | 22  3  24  27 | 23  2 | 24  3 |
| 25  5 | 26 | 27  3 | 28 | 29  1 | 30  2 |
| 31  4 | 32  3 | 33  2 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20

Open list: #7, #8, #9, #10, #13, #19, #21, #22, #25, #27

1. Update G & F values ONLY for newly added nodes to the open list;

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9 | 2  8 | 3  7 | 4  6 | 5  5 | 6  6 |
| 7  8  14  22 | 8  7  10  17 | 9  6  14  20 | 10  5  24  29 | 11  4 | 12  5 |
| 13  7  10  17 | 14 | 15  5  10 | 16 | 17  3 | 18  4 |
| 19  6  14  20 | 20  5  10 | 21  4  14  18 | 22  3  24  27 | 23  2 | 24  3 |
| 25  5  24  29 | 26 | 27  3  24  27 | 28 | 29  1 | 30  2 |
| 31  4 | 32  3 | 33  2 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Move to node with less F value and repeat the process 🡪 #13

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9 | 2  8 | 3  7 | 4  6 | 5  5 | 6  6 |
| 7  8  14  22 | 8  7  10  17 | 9  6  14  20 | 10  5  24  29 | 11  4 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3 | 18  4 |
| 19  6  14  20 | 20  5  10 | 21  4  14  18 | 22  3  24  27 | 23  2 | 24  3 |
| 25  5  24  29 | 26 | 27  3  24  27 | 28 | 29  1 | 30  2 |
| 31  4 | 32  3 | 33  2 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13

Open list: #7, #8, #9, #10, #19, #21, #22, #25, #27

1. Update G & F values ONLY for newly added nodes to the open list 🡪 nothing has added, 🡪 move on
2. Move to node with less F value and repeat the process 🡪 #8

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9 | 2  8 | 3  7 | 4  6 | 5  5 | 6  6 |
| 7  8  14  22 | 8  7  10 | 9  6  14  20 | 10  5  24  29 | 11  4 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3 | 18  4 |
| 19  6  14  20 | 20  5  10 | 21  4  14  18 | 22  3  24  27 | 23  2 | 24  3 |
| 25  5  24  29 | 26 | 27  3  24  27 | 28 | 29  1 | 30  2 |
| 31  4 | 32  3 | 33  2 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8

Open list: #7, #9, #10, #19, #21, #22, #25, #27, #1, #2, #3

1. Update G & F values ONLY for newly added nodes to the open list

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24  33 | 2  8  20  28 | 3  7  24  31 | 4  6 | 5  5 | 6  6 |
| 7  8  14  22 | 8  7  10 | 9  6  14  20 | 10  5  24  29 | 11  4 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3 | 18  4 |
| 19  6  14  20 | 20  5  10 | 21  4  14  18 | 22  3  24  27 | 23  2 | 24  3 |
| 25  5  24  29 | 26 | 27  3  24  27 | 28 | 29  1 | 30  2 |
| 31  4 | 32  3 | 33  2 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Move to node with less F value in the whole map 🡪 #21

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24  33 | 2  8  20  28 | 3  7  24  31 | 4  6 | 5  5 | 6  6 |
| 7  8  14  22 | 8  7  10 | 9  6  14  20 | 10  5  24  29 | 11  4 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3 | 18  4 |
| 19  6  14  20 | 20  5  10 | 21  4  14  18 | 22  3  24  27 | 23  2 | 24  3 |
| 25  5  24  29 | 26 | 27  3  24  27 | 28 | 29  1 | 30  2 |
| 31  4 | 32  3 | 33  2 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21

Open list: #7, #9, #10, #19, #22, #25, #27, #1, #2, #3

1. Update G & F values ONLY for newly added nodes to the open list 🡪 none!

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24  33 | 2  8  20  28 | 3  7  24  31 | 4  6 | 5  5 | 6  6 |
| 7  8  14  22 | 8  7  10 | 9  6  14  20 | 10  5  24  29 | 11  4 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3 | 18  4 |
| 19  6  14  20 | 20  5  10 | 21  4  14 | 22  3  24  27 | 23  2 | 24  3 |
| 25  5  24  29 | 26 | 27  3  24  27 | 28 | 29  1 | 30  2 |
| 31  4 | 32  3 | 33  2 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Move to node with less F value in the whole map 🡪 either #9 or #19 🡪 #9.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24  33 | 2  8  20  28 | 3  7  24  31 | 4  6 | 5  5 | 6  6 |
| 7  8  14  22 | 8  7  10 | 9  6  14  20 | 10  5  24  29 | 11  4 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3 | 18  4 |
| 19  6  14  20 | 20  5  10 | 21  4  14 | 22  3  24  27 | 23  2 | 24  3 |
| 25  5  24  29 | 26 | 27  3  24  27 | 28 | 29  1 | 30  2 |
| 31  4 | 32  3 | 33  2 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9

Open list: #7, #9, #10, #19, #22, #25, #27, #1, #2, #3, #4

1. Update G & F values ONLY for newly added nodes to the open list

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24  33 | 2  8  20  28 | 3  7  24  31 | 4  6  28  34 | 5  5 | 6  6 |
| 7  8  14  22 | 8  7  10 | 9  6  14 | 10  5  24  29 | 11  4 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3 | 18  4 |
| 19  6  14  20 | 20  5  10 | 21  4  14 | 22  3  24  27 | 23  2 | 24  3 |
| 25  5  24  29 | 26 | 27  3  24  27 | 28 | 29  1 | 30  2 |
| 31  4 | 32  3 | 33  2 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Move to node with less F value in the whole map 🡪 #19

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24  33 | 2  8  20  28 | 3  7  24  31 | 4  6  28  34 | 5  5 | 6  6 |
| 7  8  14  22 | 8  7  10 | 9  6  14 | 10  5  24  29 | 11  4 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3 | 18  4 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24  27 | 23  2 | 24  3 |
| 25  5  24  29 | 26 | 27  3  24  27 | 28 | 29  1 | 30  2 |
| 31  4 | 32  3 | 33  2 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19

Open list: #7, #9, #10, #19, #22, #25, #27, #1, #2, #3, #4

1. Update G & F values ONLY for newly added nodes to the open list 🡪 nothing has added, 🡪 move on
2. Move to node with less F value and repeat the process 🡪 #7

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24  33 | 2  8  20  28 | 3  7  24  31 | 4  6  28  34 | 5  5 | 6  6 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24  29 | 11  4 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3 | 18  4 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24  27 | 23  2 | 24  3 |
| 25  5  24  29 | 26 | 27  3  24  27 | 28 | 29  1 | 30  2 |
| 31  4 | 32  3 | 33  2 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7

Open list: #7, #9, #10, #19, #22, #25, #27, #1, #2, #3, #4

1. Update G & F values ONLY for newly added nodes to the open list 🡪 nothing has added, 🡪 move on
2. Move to node with less F value in the whole map🡪 either #22 or #27 🡪 #22

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24  33 | 2  8  20  28 | 3  7  24  31 | 4  6  28  34 | 5  5 | 6  6 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24  29 | 11  4 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38  41 | 18  4 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34  36 | 24  3 |
| 25  5  24  29 | 26 | 27  3  24  27 | 28 | 29  1  38  39 | 30  2 |
| 31  4 | 32  3 | 33  2 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22

Open list: #7, #9, #10, #19, #22, #25, #27, #1, #2, #3, #4, #17, #23, #29

1. Move to node with less F value in the whole map🡪 #27

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24  33 | 2  8  20  28 | 3  7  24  31 | 4  6  28  34 | 5  5 | 6  6 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24  29 | 11  4 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38  41 | 18  4 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34  36 | 24  3 |
| 25  5  24  29 | 26 | 27  3  24 | 28 | 29  1  38  39 | 30  2 |
| 31  4 | 32  3  38  41 | 33  2  34  36 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27

Open list: #10, #25, #1, #2, #3, #4, #17, #23, #29, #32, #33

1. Move to node with less F value in the whole map🡪 #2

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24  33 | 2  8  20 | 3  7  24  31 | 4  6  28  34 | 5  5 | 6  6 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24  29 | 11  4 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38  41 | 18  4 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34  36 | 24  3 |
| 25  5  24  29 | 26 | 27  3  24 | 28 | 29  1  38  39 | 30  2 |
| 31  4 | 32  3  38  41 | 33  2  34  36 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27, #2

Open list: #10, #25, #1, #3, #4, #17, #23, #29, #32, #33

1. Move to node with less F value in the whole map🡪 #10

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24  33 | 2  8  20 | 3  7  24  31 | 4  6  28  34 | 5  5  38  43 | 6  6 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24 | 11  4  34  38 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38  41 | 18  4 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34  36 | 24  3 |
| 25  5  24  29 | 26 | 27  3  24 | 28 | 29  1  38  39 | 30  2 |
| 31  4 | 32  3  38  41 | 33  2  34  36 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27, #2, #10

Open list: #25, #1, #3, #4, #17, #23, #29, #32, #33, #5, #11

1. Move to node with less F value in the whole map🡪 #25

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24  33 | 2  8  20 | 3  7  24  31 | 4  6  28  34 | 5  5  38  43 | 6  6 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24 | 11  4  34  38 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38  41 | 18  4 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34  36 | 24  3 |
| 25  5  24 | 26 | 27  3  24 | 28 | 29  1  38  39 | 30  2 |
| 31  4  34  38 | 32  3  38  41 | 33  2  34  36 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27, #2, #10, #25

Open list: #1, #3, #4, #17, #23, #29, #32, #33, #5, #11, #31

1. Move to node with less F value in the whole map🡪 #3

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24  33 | 2  8  20 | 3  7  24 | 4  6  28  34 | 5  5  38  43 | 6  6 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24 | 11  4  34  38 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38  41 | 18  4 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34  36 | 24  3 |
| 25  5  24 | 26 | 27  3  24 | 28 | 29  1  38  39 | 30  2 |
| 31  4  34  38 | 32  3  38  41 | 33  2  34  36 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27, #2, #10, #25, #3

Open list: #1, #4, #17, #23, #29, #32, #33, #5, #11, #31, none!

1. Move to node with less F value in the whole map🡪 #1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24 | 2  8  20 | 3  7  24 | 4  6  28  34 | 5  5  38  43 | 6  6 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24 | 11  4  34  38 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38  41 | 18  4 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34  36 | 24  3 |
| 25  5  24 | 26 | 27  3  24 | 28 | 29  1  38  39 | 30  2 |
| 31  4  34  38 | 32  3  38  41 | 33  2  34  36 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27, #2, #10, #25, #3, #1

Open list: #4, #17, #23, #29, #32, #33, #5, #11, #31, none!

1. Move to node with less F value in the whole map🡪 #4

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24 | 2  8  20 | 3  7  24 | 4  6  28 | 5  5  38  43 | 6  6 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24 | 11  4  34  38 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38  41 | 18  4 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34  36 | 24  3 |
| 25  5  24 | 26 | 27  3  24 | 28 | 29  1  38  39 | 30  2 |
| 31  4  34  38 | 32  3  38  41 | 33  2  34  36 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27, #2, #10, #25, #3, #1, #4

Open list: #17, #23, #29, #32, #33, #5, #11, #31, none!

1. Move to node with less F value in the whole map🡪 #23 or #33 🡪 #23

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24 | 2  8  20 | 3  7  24 | 4  6  28 | 5  5  38  43 | 6  6 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24 | 11  4  34  38 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38  41 | 18  4  48  52 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34 | 24  3  44  47 |
| 25  5  24 | 26 | 27  3  24 | 28 | 29  1  38  39 | 30  2  48  50 |
| 31  4  34  38 | 32  3  38  41 | 33  2  34  36 | 34 | 35 | 36  1 |
| 37  5 | 38  4 | 39  3 | 40  2 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27, #2, #10, #25, #3, #1, #4, #23

Open list: #17, #29, #32, #33, #5, #11, #31, #18, #24, #30

1. Move to node with less F value in the whole map🡪 #33

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24 | 2  8  20 | 3  7  24 | 4  6  28 | 5  5  38  43 | 6  6 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24 | 11  4  34  38 | 12  5 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38  41 | 18  4  48  52 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34 | 24  3  44  47 |
| 25  5  24 | 26 | 27  3  24 | 28 | 29  1  38  39 | 30  2  48  50 |
| 31  4  34  38 | 32  3  38  41 | 33  2  34 | 34 | 35 | 36  1 |
| 37  5 | 38  4  48  52 | 39  3  44  47 | 40  2  48  50 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27, #2, #10, #25, #3, #1, #4, #23, #33

Open list: #17, #29, #32, #5, #11, #31, #18, #24, #30, #38, #39, #40

1. Move to node with less F value in the whole map🡪 #11

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24 | 2  8  20 | 3  7  24 | 4  6  28 | 5  5  38  43 | 6  6  48  54 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24 | 11  4  34 | 12  5  44  49 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38  41 | 18  4  48  52 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34 | 24  3  44  47 |
| 25  5  24 | 26 | 27  3  24 | 28 | 29  1  38  39 | 30  2  48  50 |
| 31  4  34  38 | 32  3  38  41 | 33  2  34 | 34 | 35 | 36  1 |
| 37  5 | 38  4  48  52 | 39  3  44  47 | 40  2  48  50 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27, #2, #10, #25, #3, #1, #4, #23, #33, #11

Open list: #17, #29, #32, #5, #31, #18, #24, #30, #38, #39, #40, #6, #12

1. Move to node with less F value in the whole map🡪 #31

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24 | 2  8  20 | 3  7  24 | 4  6  28 | 5  5  38  43 | 6  6  48  54 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24 | 11  4  34 | 12  5  44  49 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38  41 | 18  4  48  52 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34 | 24  3  44  47 |
| 25  5  24 | 26 | 27  3  24 | 28 | 29  1  38  39 | 30  2  48  50 |
| 31  4  34 | 32  3  38  41 | 33  2  34 | 34 | 35 | 36  1 |
| 37  5  44  49 | 38  4  48  52 | 39  3  44  47 | 40  2  48  50 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27, #2, #10, #25, #3, #1, #4, #23, #33, #11, #31

Open list: #17, #29, #32, #5, #18, #24, #30, #38, #39, #40, #6, #12, #37

1. Move to node with less F value in the whole map🡪 #29

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24 | 2  8  20 | 3  7  24 | 4  6  28 | 5  5  38  43 | 6  6  48  54 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24 | 11  4  34 | 12  5  44  49 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38  41 | 18  4  48  52 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34 | 24  3  44  47 |
| 25  5  24 | 26 | 27  3  24 | 28 | 29  1  38 | 30  2  48  50 |
| 31  4  34 | 32  3  38  41 | 33  2  34 | 34 | 35  0  48  48 | 36  1  52  53 |
| 37  5  44  49 | 38  4  48  52 | 39  3  44  47 | 40  2  48  50 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27, #2, #10, #25, #3, #1, #4, #23, #33, #11, #31, #29

Open list: #17, #32, #5, #18, #24, #30, #38, #39, #40, #6, #12, #37, #35, #36

1. Move to node with less F value in the whole map🡪 #32

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24 | 2  8  20 | 3  7  24 | 4  6  28 | 5  5  38  43 | 6  6  48  54 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24 | 11  4  34 | 12  5  44  49 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38  41 | 18  4  48  52 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34 | 24  3  44  47 |
| 25  5  24 | 26 | 27  3  24 | 28 | 29  1  38 | 30  2  48  50 |
| 31  4  34 | 32  3  38 | 33  2  34 | 34 | 35  0  48  48 | 36  1  52  53 |
| 37  5  44  49 | 38  4  48  52 | 39  3  44  47 | 40  2  48  50 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27, #2, #10, #25, #3, #1, #4, #23, #33, #11, #31, #29, #32

Open list: #17, #5, #18, #24, #30, #38, #39, #40, #6, #12, #37, #35, #36, none!

1. Move to node with less F value in the whole map🡪 #17

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24 | 2  8  20 | 3  7  24 | 4  6  28 | 5  5  38  43 | 6  6  48  54 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24 | 11  4  34 | 12  5  44  49 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38 | 18  4  48  52 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34 | 24  3  44  47 |
| 25  5  24 | 26 | 27  3  24 | 28 | 29  1  38 | 30  2  48  50 |
| 31  4  34 | 32  3  38 | 33  2  34 | 34 | 35  0  48  48 | 36  1  52  53 |
| 37  5  44  49 | 38  4  48  52 | 39  3  44  47 | 40  2  48  50 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27, #2, #10, #25, #3, #1, #4, #23, #33, #11, #31, #29, #32, #17

Open list: #5, #18, #24, #30, #38, #39, #40, #6, #12, #37, #35, #36, none!

1. Move to node with less F value in the whole map🡪 #5

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24 | 2  8  20 | 3  7  24 | 4  6  28 | 5  5  38 | 6  6  48  54 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24 | 11  4  34 | 12  5  44  49 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38 | 18  4  48  52 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34 | 24  3  44  47 |
| 25  5  24 | 26 | 27  3  24 | 28 | 29  1  38 | 30  2  48  50 |
| 31  4  34 | 32  3  38 | 33  2  34 | 34 | 35  0  48  48 | 36  1  52  53 |
| 37  5  44  49 | 38  4  48  52 | 39  3  44  47 | 40  2  48  50 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27, #2, #10, #25, #3, #1, #4, #23, #33, #11, #31, #29, #32, #17, #5

Open list: #18, #24, #30, #38, #39, #40, #6, #12, #37, #35, #36, none!

1. Move to node with less F value in the whole map🡪 #39

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24 | 2  8  20 | 3  7  24 | 4  6  28 | 5  5  38 | 6  6  48  54 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24 | 11  4  34 | 12  5  44  49 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38 | 18  4  48  52 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34 | 24  3  44  47 |
| 25  5  24 | 26 | 27  3  24 | 28 | 29  1  38 | 30  2  48  50 |
| 31  4  34 | 32  3  38 | 33  2  34 | 34 | 35  0  48  48 | 36  1  52  53 |
| 37  5  44  49 | 38  4  48  52 | 39  3  44 | 40  2  48  50 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27, #2, #10, #25, #3, #1, #4, #23, #33, #11, #31, #29, #32, #17, #5, 39

Open list: #18, #24, #30, #38, #40, #6, #12, #37, #35, #36, none!

1. Move to node with less F value in the whole map🡪 #24

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24 | 2  8  20 | 3  7  24 | 4  6  28 | 5  5  38 | 6  6  48  54 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24 | 11  4  34 | 12  5  44  49 |
| 13  7  10 | 14 | 15  5  10 | 16 | 17  3  38 | 18  4  48  52 |
| 19  6  14 | 20  5  10 | 21  4  14 | 22  3  24 | 23  2  34 | 24  3  44 |
| 25  5  24 | 26 | 27  3  24 | 28 | 29  1  38 | 30  2  48  50 |
| 31  4  34 | 32  3  38 | 33  2  34 | 34 | 35  0  48  48 | 36  1  52  53 |
| 37  5  44  49 | 38  4  48  52 | 39  3  44 | 40  2  48  50 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27, #2, #10, #25, #3, #1, #4, #23, #33, #11, #31, #29, #32, #17, #5, 39

Open list: #18, #30, #38, #40, #6, #12, #37, #35, #36, none!

1. Move to node with less F value in the whole map🡪 #35

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 1  9  24 | 2  8  20 | 3  7  24 | 4  6  28 | 5  5  38 | 6  6  48  54 |
| 7  8  14 | 8  7  10 | 9  6  14 | 10  5  24 | 11  4  34 | 12  5  44  49 |
| 13  7  10 | 14  6  0  6 | 15  5  10  15 | 16 | 17  3  38 | 18  4  48  52 |
| 19  6  14 | 20  5  10  15 | 21  4  14  18 | 22  3  24  27 | 23  2  34  36 | 24  3  44  47 |
| 25  5  24 | 26 | 27  3  24 | 28 | 29  1  38  39 | 30  2  48  50 |
| 31  4  34 | 32  3  38 | 33  2  34 | 34 | 35  0  48  48 | 36  1  52  53 |
| 37  5  44  49 | 38  4  48  52 | 39  3  44 | 40  2  48  50 | 41  1 | 42  2 |

1. Update open list and closed list for the agent to know which node is reachable & which is not!

Closed list: #14, #15, #20, #13, #8, #21, #9, #19, #7, #22, #27, #2, #10, #25, #3, #1, #4, #23, #33, #11, #31, #29, #32, #17, #5, #39, #35

Open list: #18, #30, #38, #40, #6, #12, #37, #36, none!