Path Planning using A* Algorithm for a Robot Equipped with a hammer

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1. Objectives

The objective of this part of project is to develop (code) the A* algorithm for a robot equipped with a hammer. The algorithm is implemented successfully. Off course, it needs several improvements especially in search efficiency and speed. However, the time is very limited. The following section presented some test cases.

2. Testing and Evaluation Results

The algorithm implementations have been tested intensively using several world maps and test cases. However, the code includes only four world maps for convenience. Moreover, the following sample test cases will be presented to shed the light on the performance of the implementation.

Test Case #1:

Using 'Map1', Euclidean distances for both G & H. The following are the results:

Map	1
World Size	4 x 10
Start Position	(0,0)
End Position	(3,0)
G	Euclidean distance
H	Euclidean distance
Solution Found	Yes
Total Path Cost	3.0
No. of Searched Cells	22
Computation Time	0.172 Sec

Legend:

Red: Walls
Green: Path Cells
Blue: Hammered Wall
White: Normal Grid Cells
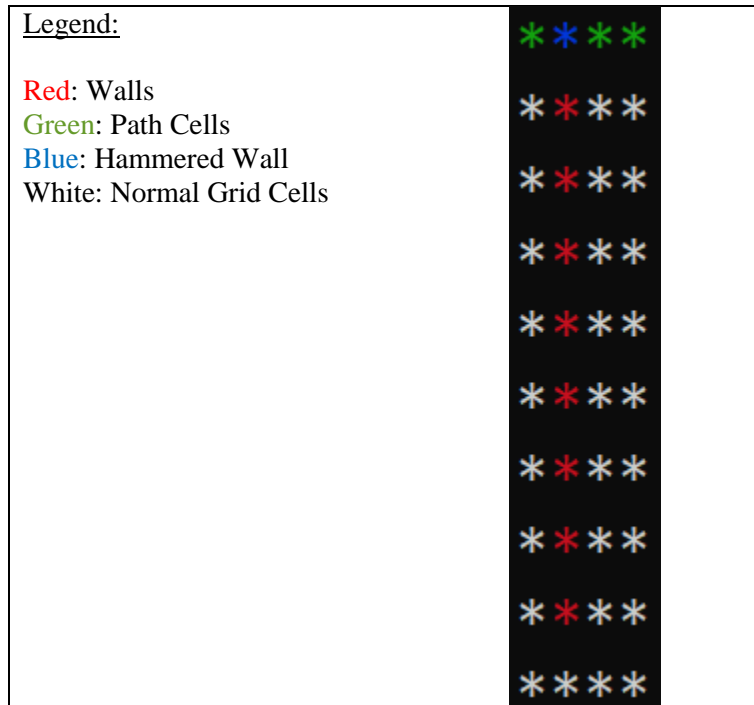
Test Case #2:

Using 'Map 4', Euclidean distances for both G & H. The following are the results:

Map	4
World Size	11 x 14
Start Position	(1,0)
End Position	(9,13)
G	Euclidean distance
H	Euclidean distance
Solution Found	Yes
Total Path Cost	22.5563
No. of Searched Cells	100
Computation Time	3.821 Sec

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