Question 1:

1. Heusristic based on actual cost like the city problem ( not the Euclidean distance but the road length)
2. Depth based: Gives more importance to deeper node than longer
3. Normalized depth: depth of node is normalized. So shallower nodes are given more importance

3. Gaschnig's heuristic is based on the idea of allowing tiles to move directly to the blank square, representing a relaxation of the 8-puzzle.

Misplaced tile heuristic just counts he no of misplaced tile and provides a lower bound value for the problem

1. in case of scenario, where the goal state is empty and misplace, the gasching and misplaced tile are similar

Ex:

Target

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

Current state:

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

b.in case of scenario, where the goal state is BLOCKED

Ex:

Target

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

Sample example

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

Here no of tiles misplaced:7 ; but we need atleast 8 moves

1. By computing minimum distance to proper by Misplaced tiles and also consider the blank position and symmetry of the tools, an estimate can be made and used.

3 a

State space: two jugs. Let (x,y) denote x is 3L jug current capacity, and y is 4L jug current capacity

Initial state (x,y) = (0,0)

Goal state (x,y) = (0,2)

Actions:

1. Empty 3l jug (x,y) to (0,y)
2. Empty 4l jug (x,y) to (x,0)
3. Fill 3-liter jug fully: (x,y) to (3,y)
4. Fill 4-liter jug fully: (x,y) to (x,4)
5. Pour water from 3-liter jug to 4-liter jug: (x,y) to (max(0,x-(4-y),min(4,x+y))
6. Pour water from 3-liter jug to 4-liter jug: (x,y) to (min(3,x+y),max(0,y−(3−x)))

B h(x,y) = max(0,3-x)+max(0,2-x) + max(0,5-min(x,y))

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