CSCI – 630: Foundation of Intelligent Systems

Project 1: Rolling Die Mazes

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1. Problem Definiton
2. Heuristics :

The three heuristic functions we used were i) Manhattan Distance, ii) Euclidean Distance, iii) Die Orientation Distance

1. Performance Metrics:

The table below shows the number of nodes visited (Visited), number of nodes generated (Generated) and number of steps in solution path (Solution) for each of three heuristics.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Manhattan Distance** | | | **Euclidean Distance** | | | **Die Orientation Distance** | | |
|  | Visited | Generated | Solution | Visited | Generated | Solution | Visited | Generated | Solution |
| **Problem 1** | 15 | 22 | 6 | 15 | 22 | 6 | 9 | 13 | 6 |
| **Problem 2** | 58 | 79 | 16 | 60 | 82 | 16 | 47 | 64 | 16 |
| **Problem 3** | 3 | 3 | - | 3 | 3 | - | 3 | 3 | - |
| **Problem 4** | 99 | 126 | 21 | 101 | 126 | 21 | 64 | 81 | 21 |
| **Problem 5** | 875 | 1396 | 26 | 1072 | 1626 | 26 | 123 | 226 | 26 |

Following is a bar graph representation of the number of nodes visited for all the 5 puzzles using each of the three heuristics:

**Blue = Manhattan Distance, Orange = Euclidean Distance, Grey = Die Orientation Distance**

**Following is a bar graph comparing the number of nodes generated** for all the 5 puzzles using each of the three heuristics:

1. **Discussion:**