Artificial Intelligence for Robotics - Assignment 05

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For this assignment, you can work in a team of two. Each one in the team should be able to present all submitted material.

1. Explain the working of uniform cost search.
2. During lecture you had a look on two heuristics for the 8-puzzle game: Manhatten distance and misplaced tiles. Hansson [1] proposes an improved heuristic that can be used for the 8-puzzle game as well. Your task is to:
   - Implement a greedy search solver for the 8-puzzle with each of the three heuristics.
   - Implement an A* search solver for the 8-puzzle with each of the three heuristics.
   - Compare the heuristics performance in greedy search and A*.
   - Generate random start states for evaluation. Measure and compare the differences. For e.g. the length of the solution, the visited nodes during the search and the computational performance.
   - Comment if the heuristics are consistent or inconsistent.

References

[1] Othar Hansson, Andrew Mayer, and Moti Yung, Criticizing solutions to relaxed models yields powerful admissible heuristics. Information Sciences, 63(3):207 227, 1992.