Consider again the two heuristics h1 and h2. Answer the following questions. Explain your answer.

1. Are h1 and h2 admissible?

2. Which heuristic among h1 and h2 performs better, and why?

3. Which of the following heuristics are admissible?

- h3 = (h1+h2)/2

- h4 = 2 × h1

- h5 = max(h1,h2)

1. Our heuristic cost function h(s), can have a max value of 8 for h1, since we can max have 8 misplaced tiles on our 8-puzzle, since the blank tile does not count.

All tiles must therefore be moved, which makes h1 is admissible heuristic.

For the manhattan distance heuristic, the heuristic must also be admissible, since moving the blank tile around will always lead closer to the goal state.

2. Using the formula in Ertel (p.93, chapter 6), we can make out the big N to be number of nodes visited, that is

A well-designed heuristic would have a value of b close to 1.

To see if is better than , the condition that should always be met. Since the Manhattan distance will always be larger for most cases, since and

As we approach a larger number of visited nodes, the Manhattan distance yields a better evaluation of the current state

Definition 6.4 A heuristic cost estimate function h(s) that never overestimates the actual cost from state s to the goal is called admissible.