Task C:

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• h1 = the number of misplaced tiles; the number of squares that are not in the right place. The space is
not a tile, so it cannot be out of place.

• h2 = the Manhattan distance

1. Are h1 and h2 admissible?

An admissible heuristic is a function which never overestimates the actual cost from a state to the goal.

H1 can never return a higher number of steps than needed and is therefore admissible.

H2 returns the sum of the total Manhattan distance for all pieces to their respective end location. Therefore, it can never overestimate the cost.

in conclusion, both H1 and H2 are admissible.

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

H2 is more realistic since just returning the number of squares in the incorrect location doesn't take possible collisions into account. Neither does H2, but it gives a more reliable result. If H1 is interpreted as the cost, it assumes that each square can be moved into its correct position in 1 step without hindering another tile. It returns a very optimistic result.

3. Which of the following heuristics are admissible?

- h3 = (h1+h2)/2 : admissible, since both h1 and h2 are already admissible, their mean value will never be higher than the lowest possible distance.

- h4 = 2 × h1 : not admissible (1 misplaced tile).

- h5 = max (h1, h2) : admissible, since both h1 & h2 are admissible.