COMP 424 Assignment 1

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Question 1

**a)**

Part 1 BFS: (Sequence Puzzle from initial to the goal state)

Part 2 UCS: (Sequence Puzzle from initial to the goal state)

Part 3 DFS: (Sequence Puzzle from initial to the goal state)

Part 4 ID: (Sequence Puzzle from initial to the goal state)

**b)**

Yes, Manhattan distance has the h value is still admissible.

Justify: As the transition cost is equal to the number of the piece that is moved. The actual minimum cost for a travel becomes the following equation while n is the number of piles we are going to slide:

and the previous cost

New Min Cost >= Old Min Cost (***h1***), which means the Manhattan distance is still admissible.

**c)**

Make the New Cost as shown below as the new heuristic value ***h2***:

Since the New Min Cost (***h2***) <= The Actual Min Cost, this heuristic value dominates h1 (proven above), and is admissible.

**d)**

No, if the setup is not like the initial state and goal state shown on this question, but just need us to swap the top and bottom pile to get the goal state, then the actual cost will be 0.5, but the heuristic value will be 1 (bigger than 0.5). Thus the Manhattan distance value as heuristic value at this case will not be admissible.