A* can be thought as an enhanced version of UCS that makes use of additional knowledge for estimating the cost of a path heuristics. If we were to convert the UCS program to do A* search, we would need to find heuristic for estimating the cost in this grid environment. With that in mind:

c) [2 Points] Give a simple argument that shows that the heuristic function directly using Manhattan Distance is consistent.

Manhattan distance is the shortest path between two nodes on a grid. Therefore whenever passing a node that is not optimal to the goal, the distance would increase

d) [2 Points] Design one admissible heuristic function other than using Manhattan Distance.

One possible heuristic is vertical grid distance to target, which is also the shortest vertical grid number to cross in order to reach goal

As shortest vertical distance is always equal or smaller than actual distance, even if all costs are 1, actual distance may include horizontal distance. Therefore it's admissible