

Linear Conflict Heuristic

To calculate linear conflict heuristic, firstly total Manhattan distance is calculated. Total Manhattan distance is the sum of distances of the tiles between goal state and current state. The tiles between 1-6 is calculated and surely there is no need for 0's.

After summing Manhattan distances code should analyze linear conflict in a state. If all below requirements applies on the current state, the cost is summed with 2.

- A pair, which is on the same row/column in goal state, is also on the same row/column in the current state. (If it is on the same row in goal, must be row in current state)
- One of the pair must not be 0.
- The greater number should be in less number's left if it is a row. If it is a column, the greater number should be above less number.

For instance, 6-5-4 (row) requires 4 additional linear conflict heuristic. 2 for 6-5 and 2 for 5-4.

Another example is 6-0-4 (row) requires 2 additional linear conflict heuristic 2 for 6-4. If it was 4-0-6 the answer is 0.

The last example is that 0-1-4 (column) does not require any additional linear conflict.

Additionally if the cost+heuristic is equal, actions are considered to find next node with the order "u", "r", "d", "l". Then, row of 0 is considered, even these are the same, the column of 0 is important. If all are same, which was entered the fringe earlier will be the accepted.