CSE 404: Task-1(Group: A1)

SOLVING "12-Knight Puzzle" USING A* SEARCH

In this assignment you will have to solve the game "12-Knight Puzzle" using A* search. In this assignment you are given a 5 x 5 board. 24 knights (12 Black, 12 White knights) are placed randomly on the board. A position in the board is therefore empty. On each move, any knight can move to that position. Your task is to find the sequence of moves to arrange them like the following.

The Problem

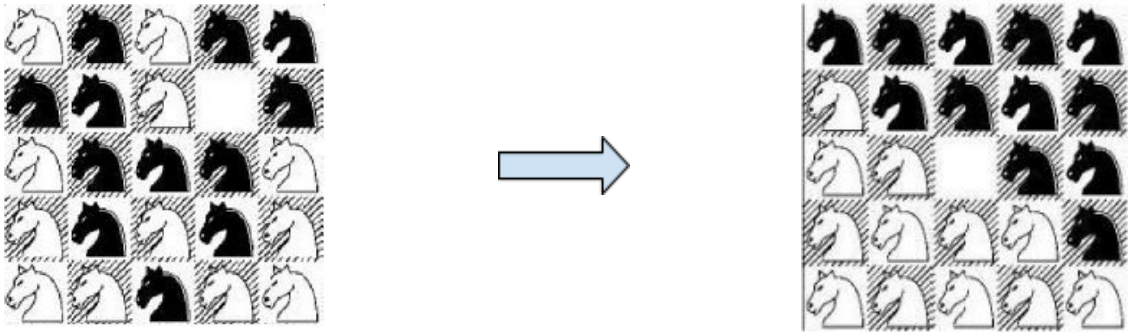

Fig-A **Fig-B**

Rules:

- ❏ Chess board of 5x5, 12 knights of each black and white color, one square is empty.
- ❏ Knight can move according to the movement of knight in chess board (2 square in horizontal and 1 square in vertical and vice-versa).
- ❏ Arrange the board according to Fig-B where black and white color knights are separated and empty space is kept in the middle position.

A* Search

Refer to the slide provided in class.

The tasks

1. You have to design **at least** two different heuristics for the problem. The board size must be 5x5.
2. You will have to implement A* search to solve the problem, and implement both of the heuristics. Bonus will be given for GUI implementation and designing more than two heuristics.
3. You have to write a short report (Max 1-1.5 page, pdf), explaining the proposed heuristics and the comparative performance (optimality and runtime) of your proposed heuristics.