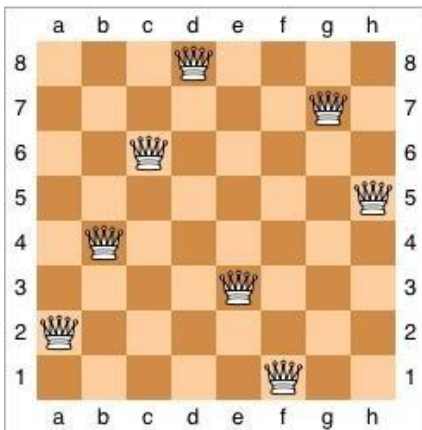# 8-Queen Problem using Hill Climbing

The 8-queens problems asks us to place 8 queens on a chessboard so that no two can capture one another; that is, no two are on the same row, column, or diagonal. One solution (source: Wikipedia) is shown below:



The first observation is that, in any solution, no two queens can occupy the same column, and consequently no column can be empty. At the start we can therefore assign a column to each queen and reduce the problem to the simpler task of finding an appropriate row.

## Statement of the Problem:

Consider an $8 \times 8$ chessboard. Place In queens on the board such that no two queens are attacking each other. The queen is the most powerful piece in chess and can attack from any distance horizontally, vertically, or diagonally. Thus, a solution must place the queens such that no two queens are in the same row, the same column, or along the same diagonal.

## To do:
- Create a 2D array to represent chessboard and initialize it with zero.
- Write a function to randomly place Queen in the array (represent the position index with 1)
- Write a function to calculate the objective function i.e., Number of queens attacking each other.
- Write a function to search for the solution using Hill climbing (Algorithm given below)