It's Game Time!

Daniel Yee
CIS 2168

Purpose

In this assignment, you will practice recursive algorithm design and implementation to solve classic chess problems.

The Problems

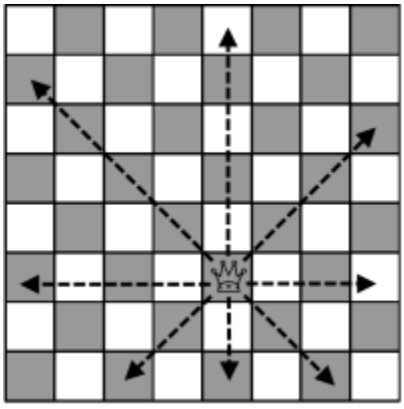
1. Playing Chess (and maybe beating Deep Blue?)

Many digital chess games where you play against a computer utilize recursive algorithms to help determine what move it should make. Therefore you often need to be a chess grandmaster like Garry Kasparov to have a chance (and even he lost to Deep Blue in the second match).

Choose and complete one of the two following chess problems.

Queens (Not the Borough)

You must place eight queens on a chessboard such that no queen can capture any other queen. If you are not familiar with chess, queens can move (any number of spaces) and capture other chess pieces vertically, horizontally, and diagonally.

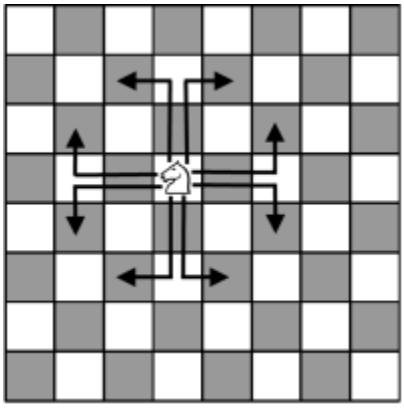


You can use an 8x8 int[][] array to represent the chessboard. Your solution should be either the

chessboard with each square marked with the positions of the queens or by listing the coordinates of each queen. (See below for proper chess notation.)

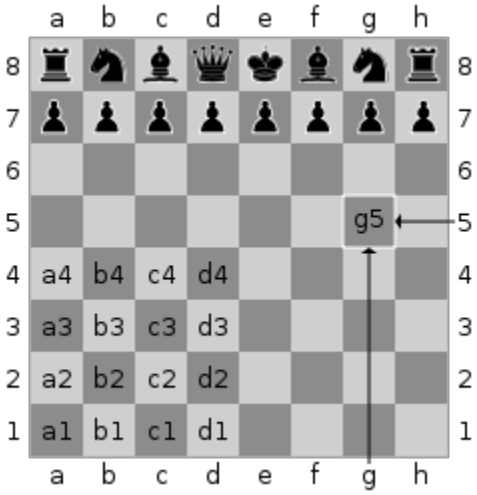
The Knight

Place the knight on the chessboard and move it until the knight visits each square of the chessboard exactly once. A knight moves in an “L” shape. A square is visited once the knight lands on it.



The knight may start anywhere on the chessboard. Your solution should be either the chessboard with each square marked in numerical order that the knight visits them or by listing, in order, the coordinates that the knight moves. (See below for proper chess notation.)

Algebraic Notation for Chess Coordinates



2. Sudoku

Write a method that can solve a Sudoku puzzle. You can represent the puzzle you want to solve as a 2D integer array. The general backtracking algorithm below can be used to solve Sudoku puzzles as well.

Hint

This assignment can be solved using the general backtracking algorithm.

```
if solution has been found
        return true

for each possible choice
        if choice is valid
                mark (board) with choice
                if recursive call has found solution
                        return true

clear any marks on board at current choice

return false
```

Rubric

45 points

You correctly solve one of the chess problems.

45 points

You correctly solve a Sudoku puzzle.

10 points

Code is neat and properly indented.

Presentation

You will only receive credit for the assignment if you present your project.