Problem Solving: Sudoku

✶ Rules of the Game

Sudoku is played with a 9 by 9 "board" consisting of nine 3 by 3 sub-boards. The symbols 1 - 9 (any 9 unique symbols could be used, e.g., A - I) are placed on the board with the following constraints.

1. Each symbol may appear only once in each row.
2. Each symbol may appear only once in each column.
3. Each symbol may appear only once in each sub-board.

In a typical game, you are given a partially filled board and are required to fill out the rest of the squares consistent with the rules.
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- Many sites on web. For example:
  - [www.dkmsoftware.com/sudoku](http://www.dkmsoftware.com/sudoku)
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What Could a Computer Program Do?

- Basic validity checking. Make sure the rules are not broken.
- Book-keeping that helps a human play the game.
- Suggest moves that are forced
- Suggest moves that are fairly obvious
- Higher Level strategies. What are they?
- Search when no strategies are known
  - try a series of moves
  - backtrack if they do not pan out
  - (this is often done using recursion)
Sudoku Lab

What Could a Computer Program Do?

- Write a program that checks a 9x9 array of Strings to see if all of the rules are being followed.
- Could use sets or more basic techniques