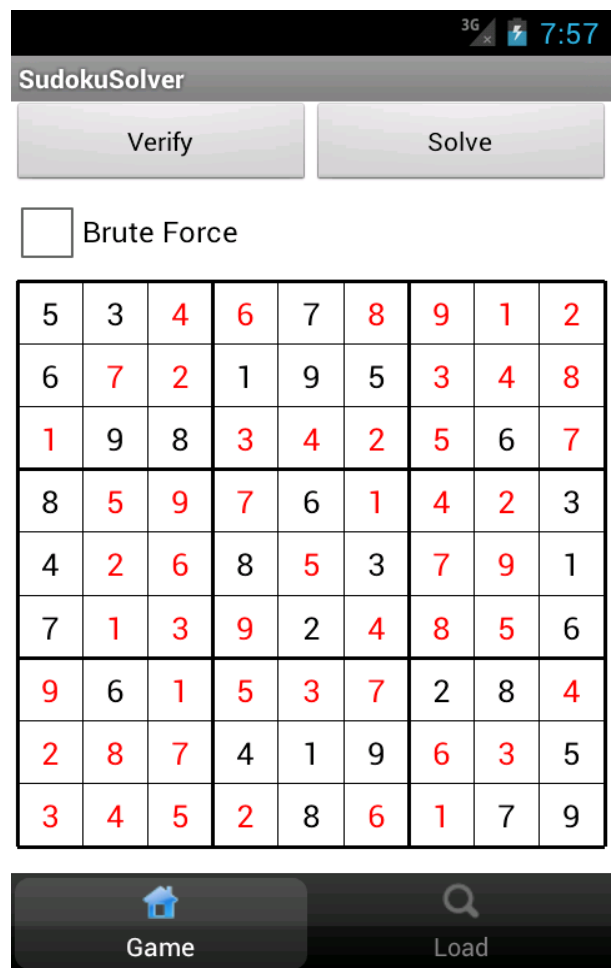
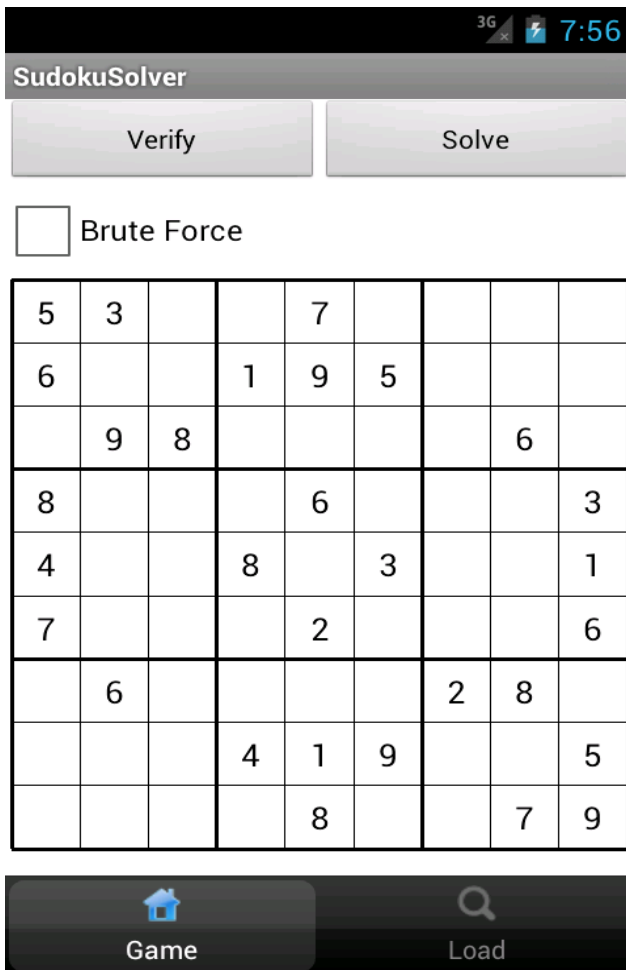


Muse Visions – Android JSON Sudoku Solver

Open Sudoku Solver is a Native Android application that can be used to solve Sudoku Puzzles stored on a web server in JSON format.

User interface

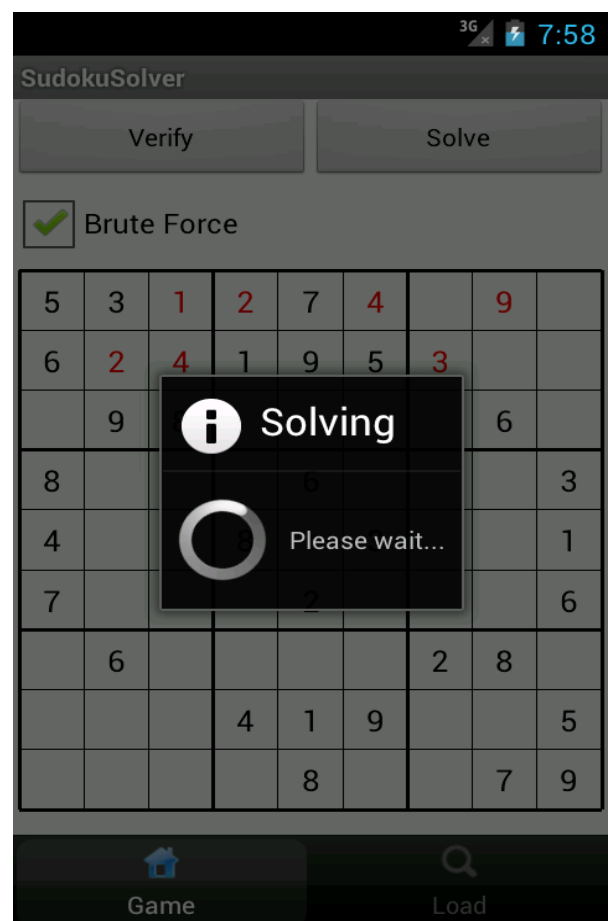
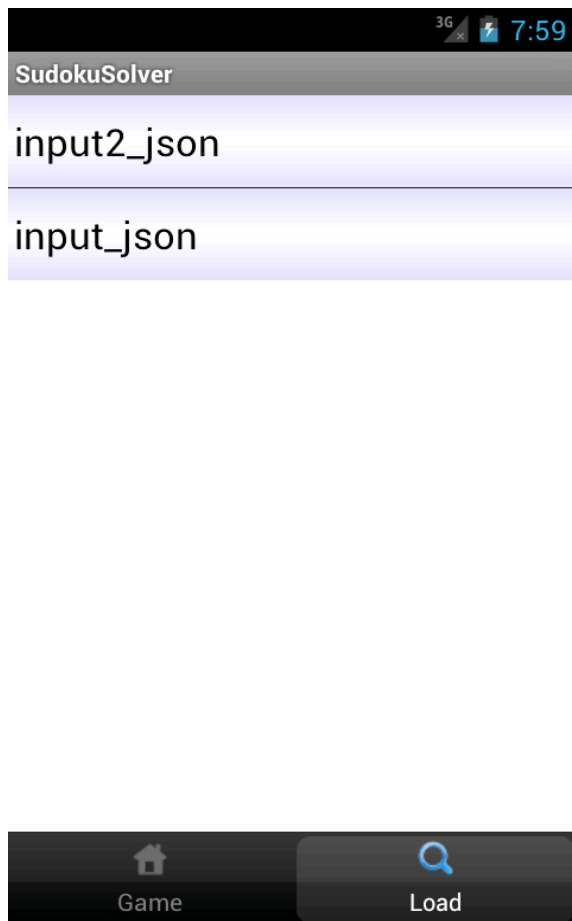
The app is composed by two main activities. The first one is illustrated below and shows a View to show the Sudoku Puzzle as well as some controls to verify and solve it.



A second view is used to load puzzles from an online server.

Once the view is loaded, a request is sent to a PHP page that scans all *.json files in the current folder and composes a global JSON Array of JSON Arrays. This is then sent back to the caller and used to populate a list view¹.

¹ NOTE: If no Internet connection is available a message will show telling the user so.



Each element in the list correspond to a valid JSON Array, and can be loaded into the main view by tapping on it.

Sudoku solver

Brute Force

A Brute force Sudoku solver has been implemented and tested on the device. For reference documentation about the implementation please see `SudokuSolverBruteForce.java`.

It can be observed that as the brute force solver tries all combinations, it doesn't converge in reasonable time and is therefore a not viable method for the assigned task.

Optimised Solver

An optimised solver has been found online (credit: Kevin Coulombe, <http://www.byteauthor.com/2010/08/sudoku-solver-update/>), and imported into the application code.

This solution converges in a fraction of a second and is therefore the preferred implementation.

Input format

Open Sudoku Solver accepts puzzles in the following JSON format (zero indicates values that need to be solved):

```
[  
5, 3, 0, 0, 7, 0, 0, 0, 0,  
6, 0, 0, 1, 9, 5, 0, 0, 0,  
0, 9, 8, 0, 0, 0, 0, 6, 0,  
8, 0, 0, 0, 6, 0, 0, 0, 3,  
4, 0, 0, 8, 0, 3, 0, 0, 1,  
7, 0, 0, 0, 2, 0, 0, 0, 6,  
0, 6, 0, 0, 0, 0, 2, 8, 0,  
0, 0, 0, 4, 1, 9, 0, 0, 5,  
0, 0, 0, 0, 8, 0, 0, 7, 9  
]
```

As multiple puzzles are stored in the server, a single Array of Arrays is generated by a php script and returned to the application which can then populate a list of games (see backend/generate.php).

Each time a puzzle is solved, it is uploaded again to the server appending a “.solution” suffix to the original file name, and a pop-up message informs the user about this.

The web address used to fetch the data is as follow:

<http://www.musevisions.com/sudoku/generate.php>

This can be changed as needed.

Error handling

The app expects well formed JSON arrays as specified above.

Non-well formed arrays will result in silent exceptions being thrown and depending on the type of error the resulting grid may be empty or contain spurious values.

License

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<http://creativecommons.org/licenses/by/3.0/>

Credits

Sudoku Solver Java implementation: Kevin Coulombe

<http://www.byteauthor.com/2010/08/sudoku-solver-update/>

Release

JSON Sudoku Solver is available on Google Play Store at the following address:

<https://play.google.com/store/apps/details?id=com.musevisions.android.SudokuSolver>