CS4523 Artificial Intelligence D. Michael Franklin
Project 0
Sudoku Analysis

Premise: For this project I want you to learn how to reason about problems in the real-world. Note that this is not a Sudoku solver, though that should be your goal. My desire is that you learn how a human plays Sudoku then attempt to get your computer to play. I DO NOT want you to google up versions of this code, copy anyone's code, wiki the algorithms, etc. That would defeat the entire purpose of the project. Rather, I want you to reason it out on your own and turn your musings into code. It does not have to be perfect, but it should show improvement as you go. Again, you will have to digitally sign a statement that you have not looked up other people's solutions, algorithms, code, etc., nor have you helped anyone else to do the same, so keep it honest and stay within the spirit of the assignment.

Approach: Take a few minutes and play several rounds of Sudoku at the Easy level. For this, see this site: http://www.puzzles.ca/sudoku.html . It has puzzles and solutions, so get a few and work through how to solve them. Do not wander around this site looking for methods to solve, just get the puzzles and give it a go. Use a sample size of 5 easy puzzles and evaluate your solver on them. The metric will be how many correct numbers it places before it either cannot place more or places one incorrectly. This means that you will need to hold in memory the puzzle as you solve it and the solution. After you run this with your initial guess, measure the statistics of performance for each round and give an average in your report. Then iterate through improvements and statistics that support that your improvement worked or that it did not. After several iterations of this, write up a well formatted report (in standard research paper fashion, see the details below) of your task, your motivation, your design, your improvements, your algorithm, your results, etc. You will need to turn this in with your completed code.

Details: You can program in whatever language you wish, but you will need to read in the puzzle and solution in the following format:

```
1,2,3,4,5,6,7,8,9
1,2,3,4,5,6,7,8,9
…
```

Where there are no numbers there will be no characters, like this:

```
1,,3,,,6,,,9
```

These comma separated files are what I will feed your program to test it, so make sure that it can read them without issue. You will need to zip the code and turn it in on D2L with your report.

The report will be 2-3 pages in length, with diagrams, and will have the following sections: Introduction (what is the problem and your general approach), Methods (your exact approach with details), Experiments (only actual data, no conjecture, about how the experiments went, trial statistics, etc.), Analysis (your interpretation of the experimental data), and your Conclusions (reflections on what you thought worked well and what did not, how it might be improved in the future, etc.). This report can be made in any software you wish, from Word to LaTeX, but the file you turn in MUST be a .pdf.

Due date: The project due date is on the D2L site, so reference that.