

# Project 4

## CptS 355

### Fall 2005

11th November 2005

**Assigned:** 11 November, 2005

**Due:** Monday, Nov. 28, 2005, 11:59:59PM. Develop all your program in a directory named “four”. When you are finished make a gzipped tar file or zip file of the directory and turn it in using the turn-in page as for the first assignment. The name of the python file should be sudoku.py.

**Credit:** This assignment will count approximately 11% of your final grade.

**Policy:** This assignment is to be your own, personal, individual work. Do not work with other students on it: if you have a question or are stumped see the instructor or the TA.

Project 4 is intended to enhance your understanding of some of the features of the python language. For background you should read sections 1-5 of the python tutorial, <http://docs.python.org/tut/tut.html>, and refer to sections 6-9 as needed. If you are seriously interested in using python the remaining sections of the tutorial will also be helpful but I do not believe that you will need any material from them for this assignment.

In this assignment you will modify my solver for Sudoku puzzles in the following ways:

1. My solver finds one solution and stops. Your solver is to find all possible solutions to a given puzzle. When all the solutions have been found print all of them. (That is, I do NOT want you to print each solution as it is found—print only after ALL have been found.) Put a blank line or other separator between the different solutions. Do NOT use a global variable to store the solutions (hint: one possibility is to use member data).
2. Change the program so that there is no use of exceptions (either raising or handling) inside Puzzle.solve().
3. Change the representation of Entry objects to use dictionaries in place of Sets. You will probably want to read about dictionaries in the python documentation: <http://docs.python.org/lib/typesmapping.html>.

You can download a file containing my code and two example sudoku puzzles from the course calendar page where you can also find this assignment. The puzzle called example1.sud has (as far as I know) 1 solution and example1b.sud has 3 solutions. If you find a bug in my code such that it produces incorrect answers for a puzzle (either invalid answers or omitted answers) AND you provide a fix you will receive 10 extra credit points.

The supplied code differs in a small but important way from what I handed out in class: when in the process of adding a constraint a cell is reduced to having a single possible value it is necessary to propagate that fact as a new constraint.