CSC384 Spring 2015 assignment 2

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1. Does one the two models always reduce the variable domains more than the other? If so which one is more effective in pruning the variable domains. (One sentence answer).

Yes, Model-2 always reduces the variable domains more than Model-1, and Model-2 is more effective than Model-1 in pruning the variable domains.

2. How many different constraints are needed for Model-1 and for Model-2. (One sentence answer).

972 different constraints are needed for Model-1 and 27 different constraints are needed for Model-2.

3. The most space expensive problem is when the Sudoku board is initially empty. In this case all variables will have a domain of size nine. (Initially filled in cells yield variables with domain sizes of 1). When the board is initially empty, how many satisfying tuples must be stored for each constraint in Model-1, and how many satisfying tuples must be stored for each constraint in Model-2. (One sentence answer).

When the board is initially empty, 72 satisfying tuples must be stored for each constraint in Model-1 and 362880 satisfying tuples must be stored for each constraint in Model-2.

4. Assuming that each element of each tuple stored in each constraint requires 4 bytes of space, what is the total space in bytes needed to represent constraints (only the constraints) arising from the initially empty board in Model-1 and in Model-2. (One sentence answer)

The total space in bytes needed to represent constraints arising from the initially empty board would be 559872 bytes in Model-1 and 352719360 bytes in Model-2.