

Q2 questions

Question 4

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).
  - Model-2 (allDiff constraint) always reduce variable domains at least as well as Model-1 (binaryNotEqual constraint), or more than Model -1 but never less than Model-1.
2. How many different constraints are needed for Model-1 and for Model-2. (One sentence answer).
  - Model-1 needs 810 different constraints whereas Model-2 needs 27 different constraints.
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, Model-1 must store 72 satisfying tuples for each constraint whereas Model-2 must store 362880 satisfying tuples for each constraint.
4. Assuming that each element of each tuple stored in each constraint requires 4 bytes of space, what is the total space needed 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)
  - Total space needed in bytes to represent only the constraints arising from the initially empty board is 466560 bytes in Model-1 and 940584960 bytes in Model-2.