Assignment 4

Dai Li [dl37@rice.edu](mailto:dl37@rice.edu)

Yuxiang Sun [ys24@rice.edu](mailto:ys24@rice.edu)

Problem. 1 Sudoku and constraint satisfaction

Answer:

1. For any i, j≠k, Vij≠ Vik

For any i, j≠k, Vji≠ Vjk

For i=[1,2,3],j=[1,2,3], m=[1,2,3],n=[1,2,3],Alldiff(V3\*i-3+m,3\*j-3+n)

1. It checks all rows, columns and 3x3 containing existing nubmers, and apply constraints to the grids.

In this case, X74∊{1,4,5}.

1. The more constrained variable works for the grids that have more existing numbers of same row, column and 3x3.

In Figure 1, X58 X87 X64 X74 should be assigned first according to value ordering.

Because X58 has to be assigned 5 and X18 has to be assigned 4. Therefore X74 can only be assigned 7. It can not be derived from single step forward checking and arc consistency because it depends on the value of unassigned grids.

Problem 4 Sudoku and repair algorithms

Answer:

It is a good solution to Sudoku problem. Meanwhile it may not be as efficient as it is on N Queen problem. Because it has more constraints than N Queen problem thus complete assignment and repairing might fail. Maybe using partial assignment and a modified minimum conflicts heuristic that give initial existing numbers constraints higher priority will solve it more efficiently.