Question 1: Naked Twins

Constraint propagation is the process of applying constraints or a set of rules while finding an optimal solution. Constraint satisfaction is important when finding an optimal solution because it keeps the search process in a check and make sure that the search agent adheres to the rules of a game. Sometimes constrains are implemented along with the search algorithm to effectively reduce the search space.

Naked twin rule is one such constraint/rule that is applied while playing Sudoku to improve the search process. Naked twins are all the pairs of boxes/cells in a row or column or a 3\*3 unit that have the exact same 2 digits in them. The constraint that needs to be applied when the agent comes across a pair of naked twins is as follows: Assign the two digits to the pair of boxes i.e. one each and remove the two digits from all its peers (along the row or column or a 3\*3 unit) as the digits have already been assigned to the pair of boxes.

Question 2: Diagonal Sudoku

The Diagonal Sudoku is solved just like the normal Sudoku but now the search agent should also apply the constraints for the Diagonal cells, adding the diagonal constraint reduces the search space of the problem. The basic constraints applied for the diagonal Sudoku implemented in this assignment are

1. Elimination Rule: If a value is assigned to a particular box eliminate that value from all its peers.
2. Only Choice Rule: if a box can take only one value that box should be assigned with that value.
3. Naked Twins: The naked twins constraint described above can also be incorporated into solving the diagonal Sudoku.