AI Assignment 3 report

The program has been implemented in python with no supporting modules that have to be installed to run the program.

The program implements the Naive Backtracking Algorithm to play a sudoku game, it also implements a Smart Backtracking Algorithm using the MRV.

Solutions -

Input	Output	Steps taken	Time taken
0 0 3 0 2 0 6 0 0 9 0 0 3 0 5 0 0 1 0 0 1 8 0 6 4 0 0 0 0 8 1 0 2 9 0 0 7 0 0 0 0 0 0 0 8 0 0 6 7 0 8 2 0 0 0 0 2 6 0 9 5 0 0 8 0 0 2 0 3 0 0 9 0 0 5 0 1 0 3 0 0	4 8 3 9 2 1 6 5 7 9 6 7 3 4 5 8 2 1 2 5 1 8 7 6 4 9 3 5 4 8 1 3 2 9 7 6 7 2 9 5 6 4 1 3 8 1 3 6 7 9 8 2 4 5 3 7 2 6 8 9 5 1 4 8 1 4 2 5 3 7 6 9 6 9 5 4 1 7 3 8 2	Without MRV - 256 With MRV - 50	Without MRV - 0.045s With MRV - 0.019s
0 0 0 0 4 0 0 0 7 9 0 0 1 0 0 0 8 3 0 8 3 0 0 9 0 1 0 5 0 0 0 0 0 7 0 0 0 6 0 9 8 7 0 3 0 0 0 9 0 0 0 0 0 6 0 5 0 6 0 0 1 7 0 4 9 0 0 0 1 0 0 5 1 0 0 0 3 0 0 0 0	6 1 2 3 4 8 9 5 7 9 4 5 1 7 6 2 8 3 7 8 3 2 5 9 6 1 4 5 3 1 4 6 2 7 9 8 2 6 4 9 8 7 5 3 1 8 7 9 5 1 3 4 2 6 3 5 8 6 9 4 1 7 2 4 9 7 8 2 1 3 6 5 1 2 6 7 3 5 8 4 9	Without MRV - 16543 With MRV - 175	Without MRV - 4.069s With MRV - 0.061s
0 0 0 2 7 0 0 0 1 0 4 0 0 0 0 2 0 0 0 2 0 0 0 0 0 7 0 0 1 0 7 0 2 8 0 0 9 0 0 5 1 8 0 0 4 0 0 8 9 0 3 0 6 0 0 8 0 0 0 0 0 9 0 0 0 6 0 0 0 0 4 0 7 0 0 0 5 9 0 0 0	3 5 9 2 7 6 4 8 1 8 4 7 3 9 1 2 5 6 6 2 1 4 8 5 9 7 3 4 1 5 7 6 2 8 3 9 9 6 3 5 1 8 7 2 4 2 7 8 9 4 3 1 6 5 1 8 2 6 3 4 5 9 7 5 9 6 1 2 7 3 4 8 7 3 4 8 5 9 6 1 2	Without MRV - 26849 With MRV - 73	Without MRV - 9.849s With MRV - 0.03s

0 0 0 0 0 0 0 0 1 0 0 6 8 0 0 5 0 0 8 0 0 0 6 0 0 2 9 0 6 9 4 0 7 0 0 0 0 4 0 0 0 0 0 3 0 0 0 0 3 0 5 9 4 0 4 8 0 0 7 0 0 0 3 0 0 7 0 0 9 1 0 0 2 0 0 0 0 0 0 0 0	9 7 3 2 5 4 8 6 1 1 2 6 8 9 3 5 7 4 8 5 4 7 6 1 3 2 9 3 6 9 4 8 7 2 1 5 5 4 2 9 1 6 7 3 8 7 1 8 3 2 5 9 4 6 4 8 5 1 7 2 6 9 3 6 3 7 5 4 9 1 8 2 2 9 1 6 3 8 4 5 7	Without MRV - 17458 With MRV - 56	Without MRV - 4.452s With MRV - 0.023s

By seeing the above results it can be concluded that the usage of MRV significantly reduces the number of steps taken to solve the problem while also using less time.