

-----+---EASY---+-----

7 8 4 | 9 3 2 | 1 5 6

6 1 9 | 4 8 5 | 3 2 7

2 3 5 | 1 7 6 | 4 8 9

-----+-----+-----

5 7 8 | 2 6 1 | 9 3 4

3 4 1 | 8 9 7 | 5 6 2

9 2 6 | 5 4 3 | 8 7 1

-----+-----+-----

4 5 3 | 7 2 9 | 6 1 8

8 6 2 | 3 1 4 | 7 9 5

1 9 7 | 6 5 8 | 2 4 3

Backtracked called: 1, Backtracked failure: 0

-----+---HARD---+-----

1 5 2 | 3 4 6 | 8 9 7

4 3 7 | 1 8 9 | 6 5 2

6 8 9 | 5 7 2 | 3 1 4

-----+-----+-----

8 2 1 | 6 3 7 | 9 4 5

5 4 3 | 8 9 1 | 7 2 6

9 7 6 | 4 2 5 | 1 8 3

-----+-----+-----

7 9 8 | 2 5 3 | 4 6 1

3 6 5 | 9 1 4 | 2 7 8

2 1 4 | 7 6 8 | 5 3 9

Backtracked called: 12, Backtracked failure: 4

-----+---MEDIUM---+-----

8 7 5 | 9 3 6 | 1 4 2

1 6 9 | 7 2 4 | 3 8 5

2 4 3 | 8 5 1 | 6 7 9

-----+-----+-----

4 5 2 | 6 9 7 | 8 3 1

9 8 6 | 4 1 3 | 2 5 7

7 3 1 | 5 8 2 | 9 6 4

-----+-----+-----

5 1 7 | 3 6 9 | 4 2 8

6 2 8 | 1 4 5 | 7 9 3

3 9 4 | 2 7 8 | 5 1 6

Backtracked called: 3, Backtracked failure: 0

-----+---VERY-HARD---+-----

4 3 1 | 8 6 7 | 9 2 5

6 5 2 | 4 9 1 | 3 8 7

8 9 7 | 5 3 2 | 1 6 4

-----+-----+-----

3 8 4 | 9 7 6 | 5 1 2

5 1 9 | 2 8 4 | 7 3 6

2 7 6 | 3 1 5 | 8 4 9

-----+-----+-----

9 4 3 | 7 2 8 | 6 5 1

7 6 5 | 1 4 3 | 2 9 8

1 2 8 | 6 5 9 | 4 7 3

Backtracked called: 68, Backtracked failure: 57

Discussing the results above

The easy board gets away with calling backtrack only one time. This is because it has some many constraints that calling the inference function once is enough to obtain a solution. In other words, the program doesn't have to assume the position of any pieces, and hence it doesn't need to call backtrack more than the initial time.

The harder boards have fewer initial values set and therefore cannot solve the board with only one call to the inference function. This means that our program has to assume values in certain places, and hence it is bound to fail. Fewer initial values beget more failed backtracks.

In our function "select_unassigned_variable" we chose to not use any heuristic to determine the next variable. This means that our program will fail more than what it would if we chose an actual heuristic function. We could've decided to choose the variable which had the highest amount of neighboring constraints with more than one legal value.