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first 10 of 50 puzzle solutions and running time

Grid 01

```
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 |          cpu time: 0.004s
```

Grid 02

```
2 4 5 | 9 8 1 | 3 7 6 |
1 6 9 | 2 7 3 | 5 8 4 |
8 3 7 | 5 6 4 | 2 1 9 |
-------+-------+-------
9 7 6 | 1 2 5 | 4 3 8 |
5 1 3 | 4 9 8 | 6 2 7 |
4 8 2 | 7 3 6 | 9 5 1 |
-------+-------+-------
3 9 1 | 6 5 7 | 8 4 2 |
7 2 8 | 3 4 9 | 1 6 5 |
6 5 4 | 8 1 2 | 7 9 3 |          cpu time: 0s
```

Grid03

```
4 6 2 | 8 3 1 | 9 5 7 |
7 9 5 | 4 2 6 | 1 8 3 |
3 8 1 | 7 9 5 | 4 2 6 |
-------+-------+-------
1 7 3 | 9 8 4 | 2 6 5 |
6 5 9 | 3 1 2 | 7 4 8 |
2 4 8 | 5 6 7 | 3 1 9 |
-------+-------+-------
9 2 6 | 1 7 8 | 5 3 4 |
8 3 4 | 2 5 9 | 6 7 1 |
5 1 7 | 6 4 3 | 8 9 2 |          cpu time: 0.004s
```

Grid04

```
1 3 7 | 2 5 6 | 8 4 9 |
9 2 8 | 3 1 4 | 5 6 7 |
4 6 5 | 8 9 7 | 3 1 2 |
-------+-------+-------
6 7 3 | 5 4 2 | 9 8 1 |
8 1 9 | 6 7 3 | 2 5 4 |
5 4 2 | 1 8 9 | 7 3 6 |
-------+-------+-------
2 5 6 | 7 3 1 | 4 9 8 |
3 9 1 | 4 2 8 | 6 7 5 |
7 8 4 | 9 6 5 | 1 2 3 |          cpu time: 0.004s
```

Grid05

```
5 2 3 | 8 1 6 | 7 4 9 |
7 8 4 | 5 9 3 | 1 2 6 |
6 9 1 | 4 7 2 | 8 3 5 |
-------+-------+-------
2 3 9 | 1 4 5 | 6 8 7 |
4 5 7 | 2 6 8 | 9 1 3 |
1 6 8 | 9 3 7 | 2 5 4 |
-------+-------+-------
3 4 2 | 7 8 9 | 5 6 1 |
9 1 5 | 6 2 4 | 3 7 8 |
8 7 6 | 3 5 1 | 4 9 2 |       cpu time: 0.004s
```

Grid06

```
1 7 6 | 9 2 3 | 5 8 4 |
5 2 4 | 8 1 7 | 6 3 9 |
8 9 3 | 6 5 4 | 2 7 1 |
-------+-------+-------
9 5 7 | 3 4 8 | 1 6 2 |
6 3 8 | 1 9 2 | 4 5 7 |
4 1 2 | 7 6 5 | 3 9 8 |
-------+-------+-------
2 6 5 | 4 8 9 | 7 1 3 |
7 8 1 | 2 3 6 | 9 4 5 |
3 4 9 | 5 7 1 | 8 2 6 |       cpu time: 0.008s
```

Grid07

```
1 4 3 | 9 8 6 | 2 5 7 |
6 7 9 | 4 2 5 | 3 8 1 |
2 8 5 | 7 3 1 | 6 9 4 |
-------+-------+-------
9 6 2 | 3 5 4 | 1 7 8 |
3 5 7 | 6 1 8 | 9 4 2 |
4 1 8 | 2 7 9 | 5 6 3 |
-------+-------+-------
8 2 1 | 5 6 7 | 4 3 9 |
7 9 6 | 1 4 3 | 8 2 5 |
5 3 4 | 8 9 2 | 7 1 6 |
```
cpu time: 0.004s

Grid08

```
4 8 7 | 1 5 6 | 9 3 2 |
3 6 2 | 4 9 8 | 7 5 1 |
9 1 5 | 3 7 2 | 8 6 4 |
-------+-------+-------
8 4 6 | 5 1 9 | 2 7 3 |
5 9 3 | 7 2 4 | 1 8 6 |
2 7 1 | 8 6 3 | 5 4 9 |
-------+-------+-------
1 2 4 | 6 8 5 | 3 9 7 |
7 3 8 | 9 4 1 | 6 2 5 |
6 5 9 | 2 3 7 | 4 1 8 |
```
cpu time: 0.004s

Grid09

```
8 1 4 | 9 7 6 | 5 3 2 |
6 5 9 | 1 2 3 | 4 7 8 |
7 3 2 | 8 5 4 | 1 6 9 |
-------+-------+-------
9 4 8 | 2 6 5 | 3 1 7 |
2 7 5 | 3 4 1 | 8 9 6 |
1 6 3 | 7 9 8 | 2 4 5 |
-------+-------+-------
3 9 1 | 6 8 2 | 7 5 4 |
5 8 7 | 4 3 9 | 6 2 1 |
4 2 6 | 5 1 7 | 9 8 3 |        cpu time: 0.004s
```

Grid10

```
7 6 1 | 9 2 8 | 4 5 3 |
9 2 5 | 7 4 3 | 1 6 8 |
4 3 8 | 6 1 5 | 9 2 7 |
-------+-------+-------
3 5 7 | 4 6 1 | 2 8 9 |
8 9 4 | 3 7 2 | 6 1 5 |
2 1 6 | 5 8 9 | 3 7 4 |
-------+-------+-------
6 8 9 | 1 5 4 | 7 3 2 |
1 4 2 | 8 3 7 | 5 9 6 |
5 7 3 | 2 9 6 | 8 4 1 |        cpu time: 0.004s
```

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average time for all puzzles

0.004s

Extended part

Solution and time for the last 10 hard puzzle

95.
3 5 4 | 1 8 6 | 9 2 7 |
2 9 8 | 7 4 3 | 6 1 5 |
1 6 7 | 9 5 2 | 4 8 3 |
-------+-------+-------
4 8 1 | 5 2 7 | 3 6 9 |
9 3 2 | 6 1 4 | 5 7 8 |
5 7 6 | 3 9 8 | 2 4 1 |
-------+-------+-------
7 2 9 | 8 6 5 | 1 3 4 |
8 4 5 | 2 3 1 | 7 9 6 |
6 1 3 | 4 7 9 | 8 5 2 |

Time: 0.008s
       0.012s
       0.008s

94.
6 5 9 | 4 1 2 | 3 7 8 |
2 3 8 | 6 7 9 | 4 5 1 |
7 4 1 | 3 8 5 | 2 9 6 |
-------+-------+-------
8 6 5 | 7 2 3 | 1 4 9 |
4 2 7 | 8 9 1 | 6 3 5 |
9 1 3 | 5 4 6 | 7 8 2 |
-------+-------+-------
3 9 6 | 1 5 7 | 8 2 4 |
5 7 4 | 2 6 8 | 9 1 3 |
1 8 2 | 9 3 4 | 5 6 7 |

Time: 0.008s
       0.008s
       0.008s

93.
```
8 5 6 | 4 9 1 | 3 7 2 |
1 4 3 | 5 7 2 | 6 9 8 |
9 2 7 | 3 6 8 | 4 5 1 |
-------+-------+-------
2 7 8 | 6 4 5 | 1 3 9 |
5 1 4 | 9 2 3 | 7 8 6 |
6 3 9 | 8 1 7 | 2 4 5 |
-------+-------+-------
3 6 1 | 7 8 9 | 5 2 4 |
4 8 5 | 2 3 6 | 9 1 7 |
7 9 2 | 1 5 4 | 8 6 3 |
```

Time: 0.012s
        0.012s
        0.012s

92.
```
9 2 4 | 3 6 1 | 7 5 8 |
1 5 6 | 4 7 8 | 2 9 3 |
8 3 7 | 5 9 2 | 6 4 1 |
-------+-------+-------
6 1 3 | 2 4 7 | 9 8 5 |
7 4 9 | 1 8 5 | 3 2 6 |
5 8 2 | 9 3 6 | 1 7 4 |
-------+-------+-------
4 9 8 | 6 2 3 | 5 1 7 |
3 7 1 | 8 5 9 | 4 6 2 |
2 6 5 | 7 1 4 | 8 3 9 |
```

Time: 0.008s
        0.008s
        0.008s

91.
```
9 3 7 | 6 5 8 | 2 4 1 |
8 6 4 | 2 9 1 | 7 3 5 |
1 2 5 | 7 3 4 | 9 8 6 |
-------+-------+-------
5 8 3 | 4 1 9 | 6 2 7 |
6 4 9 | 3 7 2 | 5 1 8 |
7 1 2 | 5 8 6 | 4 9 3 |
-------+-------+-------
4 7 1 | 9 6 3 | 8 5 2 |
3 9 6 | 8 2 5 | 1 7 4 |
2 5 8 | 1 4 7 | 3 6 9 |
```

Time: 0.008s
      0.008s
      0.008s

90.
```
1 4 3 | 2 5 8 | 6 7 9 |
8 7 2 | 9 6 4 | 1 5 3 |
6 9 5 | 1 3 7 | 4 8 2 |
-------+-------+-------
9 8 6 | 5 4 1 | 3 2 7 |
4 5 1 | 3 7 2 | 9 6 8 |
2 3 7 | 8 9 6 | 5 1 4 |
-------+-------+-------
7 1 9 | 6 2 3 | 8 4 5 |
5 6 4 | 7 8 9 | 2 3 1 |
3 2 8 | 4 1 5 | 7 9 6 |
```

Time: 0.008s
      0.008s
      0.008s

89.
```
9 3 5 | 7 4 8 | 6 2 1 |
8 7 6 | 2 3 1 | 5 9 4 |
1 2 4 | 6 9 5 | 7 8 3 |
-------+-------+-------
5 1 2 | 4 6 9 | 3 7 8 |
6 4 3 | 8 7 2 | 9 1 5 |
7 8 9 | 1 5 3 | 4 6 2 |
-------+-------+-------
2 6 7 | 5 1 4 | 8 3 9 |
4 9 1 | 3 8 6 | 2 5 7 |
3 5 8 | 9 2 7 | 1 4 6 |
```

Time: 0.004s
        0.004s
        0.004s

88.
```
9 5 6 | 3 2 7 | 8 4 1 |
1 2 7 | 4 8 6 | 3 9 5 |
8 3 4 | 9 5 1 | 2 6 7 |
-------+-------+-------
5 4 8 | 7 3 9 | 6 1 2 |
2 7 1 | 8 6 4 | 5 3 9 |
3 6 9 | 2 1 5 | 4 7 8 |
-------+-------+-------
7 9 3 | 5 4 8 | 1 2 6 |
4 1 5 | 6 9 2 | 7 8 3 |
6 8 2 | 1 7 3 | 9 5 4 |
```

Time: 0.008s
        0.008s
        0.008s

87.
7 4 6 | 5 1 3 | 8 9 2 |
1 3 2 | 8 6 9 | 7 5 4 |
5 9 8 | 7 4 2 | 3 1 6 |
-------+-------+-------
3 6 7 | 9 2 5 | 4 8 1 |
9 2 5 | 4 8 1 | 6 7 3 |
4 8 1 | 6 3 7 | 9 2 5 |
-------+-------+-------
6 7 9 | 1 5 4 | 2 3 8 |
2 5 4 | 3 7 8 | 1 6 9 |
8 1 3 | 2 9 6 | 5 4 7 |

Time: 0.012s
        0.008s
        0.008s

86.
1 3 2 | 7 4 9 | 6 8 5 |
8 5 7 | 3 6 1 | 9 2 4 |
9 6 4 | 2 8 5 | 3 7 1 |
-------+-------+-------
2 1 6 | 4 5 7 | 8 3 9 |
3 4 8 | 6 9 2 | 1 5 7 |
5 7 9 | 8 1 3 | 2 4 6 |
-------+-------+-------
4 2 1 | 5 3 6 | 7 9 8 |
6 8 3 | 9 7 4 | 5 1 2 |
7 9 5 | 1 2 8 | 4 6 3 |

Time: 0.008s
        0.008s
        0.008s

85.
```
9 5 7 | 2 6 1 | 3 8 4 |
8 4 6 | 5 3 7 | 9 2 1 |
1 2 3 | 4 8 9 | 5 6 7 |
-------+-------+-------
7 3 4 | 9 2 6 | 8 1 5 |
2 9 5 | 8 1 4 | 7 3 6 |
6 1 8 | 3 7 5 | 4 9 2 |
-------+-------+-------
5 7 2 | 1 9 8 | 6 4 3 |
4 8 1 | 6 5 3 | 2 7 9 |
3 6 9 | 7 4 2 | 1 5 8 |
```

Time: 0.008s
          0.008s
          0.008s

The average time for these 10 puzzle : 0.008s

If we use the extended encoding to solve the puzzle in the basic task, the running time will be 0.00s (too small to record), so the new encoding is much faster than the minimal encoding to solve the sudoku puzzle.