

TDT4136 - Assignment 5

Aleksander Hansen

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Deliverables

Solution to the sudoku puzzles:

easy:

```
8 1 7 | 6 9 3 | 2 5 4
5 2 3 | 7 4 1 | 9 8 6
9 6 4 | 5 2 8 | 3 1 7
```

```
-----+-----+-----
```

```
6 7 1 | 8 5 9 | 4 2 3
3 4 8 | 2 6 7 | 1 9 5
2 9 5 | 1 3 4 | 7 6 8
```

```
-----+-----+-----
```

```
7 5 6 | 3 1 2 | 8 4 9
1 3 9 | 4 8 5 | 6 7 2
4 8 2 | 9 7 6 | 5 3 1
```

number of backtracks: 1

number of failed backtracks: 0

medium:

```
6 3 5 | 9 2 7 | 1 4 8
4 8 2 | 1 6 5 | 9 7 3
9 7 1 | 3 8 4 | 2 6 5
```

```
-----+-----+-----
```

```
5 2 9 | 7 1 6 | 3 8 4
8 4 6 | 2 9 3 | 5 1 7
7 1 3 | 5 4 8 | 6 9 2
```

```
-----+-----+-----
```

```
2 9 4 | 8 5 1 | 7 3 6
1 6 7 | 4 3 2 | 8 5 9
3 5 8 | 6 7 9 | 4 2 1
```

number of backtracks: 1

number of failed backtracks: 0

```

hard:
8 9 2 | 3 5 1 | 7 6 4
1 3 4 | 8 7 6 | 5 2 9
5 7 6 | 4 9 2 | 3 1 8
-----+-----+-----
7 1 5 | 6 2 9 | 4 8 3
4 6 3 | 5 1 8 | 2 9 7
2 8 9 | 7 4 3 | 6 5 1
-----+-----+-----
3 5 1 | 2 8 4 | 9 7 6
9 4 7 | 1 6 5 | 8 3 2
6 2 8 | 9 3 7 | 1 4 5
number of backtracks: 3
number of failed backtracks: 0

```

```

veryhard:
3 4 7 | 9 6 1 | 8 2 5
6 5 8 | 4 2 3 | 9 7 1
9 1 2 | 5 7 8 | 4 3 6
-----+-----+-----
5 3 4 | 2 9 7 | 6 1 8
7 6 9 | 1 8 4 | 2 5 3
2 8 1 | 3 5 6 | 7 9 4
-----+-----+-----
1 7 6 | 8 3 2 | 5 4 9
8 9 3 | 7 4 5 | 1 6 2
4 2 5 | 6 1 9 | 3 8 7
number of backtracks: 14
number of failed backtracks: 9

```

We see that for the easy and medium puzzles the program finds the solution on the first try. On the hard puzzle the program backtracks 2 more times. On the very hard puzzle the program also fails on a number of backtracking calls and has to start over when it exhausts the possible legal values for a guess.