Problem 9
Sudoku Solver

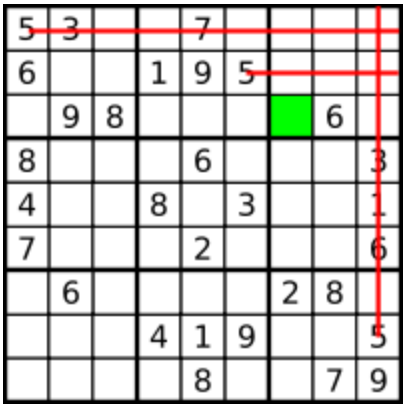
In the last decade, the *Sudoku* craze has spread from Japan to Britain and has now gained ubiquity in America as well. Some publishers of *Sudoku* puzzle-books use computer programs to generate their puzzles because it is faster and cheaper than having them created by hand.

For the uninitiated, a normal *Sudoku* problem consists of a 9x9 grid of cells made up of nine smaller 3x3 grids called regions. The puzzle begins with the grid partially filled with digits, and it is the job of the solver to fill in the blank spaces. The rule for filling in these cells is simple: each of the nine rows, columns, and regions must contain the digits 1-9, with no repetitions, one in each cell.

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

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

There are several techniques that can be used to solve *Sudoku* puzzles; one of the simplest is called cross-hatching. Cross hatching involves looking a region and trying to find the location of a missing numeral by eliminating rows and columns (that pass through the region) that already contain it. Cells within the region that already contain digits, obviously, can be eliminated as well.



In the puzzle above, the location of the numeral 5 in the upper-right region can be deduced by eliminating the rows and columns already containing a 5 and their associated cells in that region. Obviously, it cannot go in the cell already filled with the numeral 6, which leaves only one possible location: the lower left cell.

Difficult puzzles require more techniques to be solved - some requiring more advanced levels of logical deduction, the hardest requiring deduction through trial-and-error. For this problem, you will only be given puzzles classified as "easy", each of which can be solved though cross-hatching or a similar technique. Write a program that solves these problems. The particular method(s) it uses will have no impact on your score.

Input

Input will consist of one file name, and that file will contain one *Sudoku* puzzle. The file will be plaintext, with one row of the puzzle on each line. Blank cells will be denoted by a '.' (period) character, and cells containing numerals will simply be represented by digits.

Output

Acceptable output will consist of the solved *Sudoku* puzzle in the same format.

Sample input

```
puzzle.txt
```

Sample input file (puzzle.txt)

```
53..7....
6..195...
.98....6.
8...6...3
4..8.3..1
7...2...6
.6....28.
...419..5
....8..79
```

Sample output

```
534678912
672195348
198342567
859761423
426853791
713924856
961537284
287419635
345286179
```