26 Sudoku Solver

15 points

Introduction

As an aspiring programmer and sudoku fan, you have decided to become the number one sudoku completionist. You want to create a program to solve all the sudokus of the newspaper you buy every day.

Before starting, you write down the rules needed to complete a sudoku:

- You can put a number between 1-9 in each slot.

- No number can be repeated in any given row.

- No number can be repeated in any given column.

- No number can be repeated in any given 3x3 "small" square.

Now that you are ready, you will need to write a program that can solve any (solvable) sudoku to become the best.

IMPORTANT: In case of a sudoku that have multiple solutions, any valid solution is accepted.

Input

A sudoku table with the initial numbers needed to complete it. The missing numbers will be represented with a blank space, even if they are at the end of the line.

Output

The completed sudoku table. In case of multiple sudoku solutions, only one completed table.

Example 1

Input

```
 1 |2  |3 4
2 5| 6 | 7
  8| 9 |
---+---+---
3  |12 |  8
6  |8 7|  2
1  | 34|  5
---+---+---
   | 8 |9
 2 | 4 |5 6
7 4|  5| 8
```

Output

```
916|278|354
235|461|879
478|593|621
---+---+---
357|126|498
649|857|132
182|934|765
---+---+---
561|382|947
823|749|516
794|615|283
```

Example 2

Input

```
  3|685|47
5  |  4|162
7  | 19|538
---+---+---
   |9  |
39 |  1| 2
 65|  3|  1
---+---+---
4  | 6 |9 3
9  |342| 87
   |1  |  4
```

Output

```
123|685|479
589|734|162
746|219|538
---+---+---
817|926|345
394|851|726
265|473|891
---+---+---
472|568|913
951|342|687
638|197|254
```