

Student Name: _____

PROBLEM

You are given a 4 by 4 square of digits, broken down into 4 sub-squares. Each of the 16 cells contains a digit from 1 to 4, or else is blank. To solve the puzzle you place a digit in each blank cell in such a way that each row, column, and sub-square contains exactly one each of the digits from 1 to 4. For example, given the puzzle:

| | | | |
|---|---|---|---|
| | 1 | | |
| | | 2 | |
| | | | 4 |
| 3 | | | |

The solution is:

| | | | |
|---|---|---|---|
| 2 | 1 | 4 | 3 |
| 4 | 3 | 2 | 1 |
| 1 | 2 | 3 | 4 |
| 3 | 4 | 1 | 2 |

Write a program that solves the 4 by 4 Sudoku puzzle.

The input consists of four lines, each containing 4 digits with a value ranging from 0 to 4, separated by blanks. A zero in the input corresponds to a blank in the puzzle. You may assume that the input represents a puzzle with a unique solution.

The output should look like the input file, but with all the zeros replaced with appropriate digits from 1 to 4.

Example:

If the input contains the following lines:

```
0 1 0 0
0 0 2 0
0 0 0 4
3 0 0 0
```

The correct output is:

```
2 1 4 3
4 3 2 1
1 2 3 4
3 4 1 2
```