3351 Easy and Not Easy Sudoku Puzzles

Sudoku is popular puzzle demanding logic and patience. The aim of the puzzle is to enter a numeral from 1 through 9 in each cell of a 9×9 grid made up of 3×3 sub-grids, starting with various numerals given in some cells. Each row, column and sub-grid must contain only one instance of each numeral. See Figure 2 and Figure 3 for a sample puzzle and its solution.

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

Figure 2: An example of a Sudoku puzzle

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

Figure 3: A solution to the Sudoku puzzle

Some Sudoku puzzles may have *unique* solution. Dr. Susie thinks it is a good tool to enhance children's patience. However, he wants to avoid difficult puzzles so that the children will be able to solve it in a reasonable amount of time. After some research, Dr. Susie noticed that the following two heuristics are easily understood by children:

1. Each numeral can appear in any row, column, and sub-grid only once. Therefore, if the union of the numeral appeared in the same row, column and sub-grid of some free cell contains 8 numerals, and leaves only one available numeral to be filled into that cell, then it should be filled with that numeral. For example, in Figure 4, the cell marked '`x`' can only be filled with 2 since all the other 8 numerals have appeared in the row, column and sub-grid of it.

2. Each sub-grid has to contain all the numerals. Therefore, if a numeral has not appeared in some sub-grid, say numeral 1, if there is only one free cell which can be filled by 1, due to the fact that all the other free cells in that sub-grid have 1 in the same row or column, then fill that cell with numeral 1. For example, in Figure 5 only the cell marked '`x`' can be filled with 1, all the other free cells are ruled out for the possibility due to 1s appeared in other sub-grid.

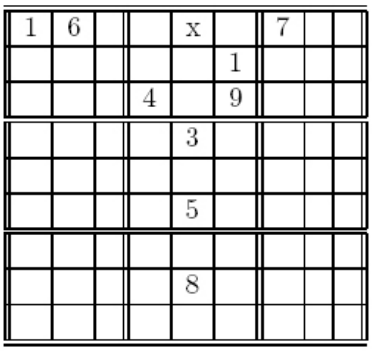

Figure 4: Heuristic Rule 1

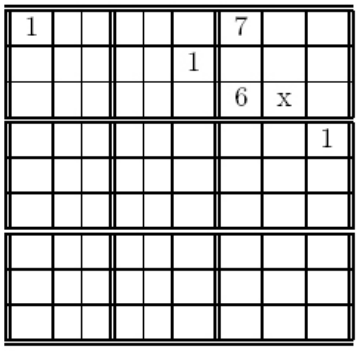

Figure 5: Heuristic Rule 2

He decided that if a puzzle can be solved by only applying the two heuristics above, then it is an *easy* puzzle, otherwise it is *not an easy puzzle*. You are to write a program to tell whether puzzles are easy or not easy.

Input

The first line contains an integer n, $n \leq 15$, indicating the number of puzzles. The following $9n$ rows contains n puzzles. Each puzzle consists of 9 rows. Each row contains 9 numerals–`0` indicates that the cell has to be filled, and other numerals indicate that the cell is given that numeral.

Output

The output are n bits. The i-th bit equals to '`1`' if the i-th puzzle is easy, and '`0`' if the puzzle is not easy.

Sample Input

```
2
0 8 0 3 0 0 0 0 9
0 0 0 0 8 0 0 0 3
3 0 0 5 0 0 0 8 2
1 9 8 4 5 7 3 2 6
5 2 3 9 6 1 8 4 7
4 7 6 2 3 8 1 9 5
9 3 4 8 2 5 7 6 1
6 5 2 0 0 4 9 3 8
8 1 7 6 9 3 2 5 4
7 8 0 3 0 0 0 0 9
0 0 0 0 8 0 0 0 3
3 0 0 5 0 0 0 8 2
1 9 8 4 5 7 3 2 6
5 2 3 9 6 1 8 4 7
4 7 6 2 3 8 1 9 5
9 3 4 8 2 5 7 6 1
6 5 2 0 0 4 9 3 8
8 1 7 6 9 3 2 5 4
```

Sample Output

```
01
```