4599 K-equivalence

Consider a set K of positive integers.

Let p and q be two non-zero decimal digits. Call them K-equivalent if the following condition applies:

> For every $n \in K$, if you replace one digit p with q or one digit q with p in the decimal notation of n then the resulting number will be an element of K.

For example, when K is the set of integers divisible by 3, the digits 1, 4, and 7 are K-equivalent. Indeed, replacing a 1 with a 4 in the decimal notation of a number never changes its divisibility by 3.

It can be seen that K-equivalence is an equivalence relation (it is reflexive, symmetric and transitive).

You are given a finite set K in form of a union of disjoint finite intervals of positive integers.

Your task is to find the equivalence classes of digits 1 to 9.

Input

nput consists of several datasets. The first line of a dataset contains n, the number of intervals composing the set K ($1 \leq n \leq 10000$). Each of the next n lines contains two positive integers a_i and b_i that describe the interval $[a_i, b_i]$ (i. e. the set of positive integers between a_i and b_i, inclusive), where $1 \leq a_i \leq b_i \leq 10^{18}$. Also, for $i \in [2..n]$: $a_i \geq b_{i-1} + 2$.

Output

For each dataset, represent each equivalence class as a concatenation of its elements, in ascending order.

Output all the equivalence classes of digits 1 to 9, one at a line, sorted lexicographically.

Print a blank line between two consecutive datasets.

Sample Input

```
1
1 566
1
30 75
```

Sample Output

```
1234
5
6
789

12
345
6
7
89
```