Next Mex

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

Happy Pi Day!

Let $f(n)$ be the smallest non-negative integer which is not a digit of n in it's decimal representation. For example, $f(0) = 1, f(210) = 3, f(2020) = 1, f(314159) = 0, f(1234567890) = 10$

You will be given two integers p and k. Let's denote Q as the set of all integers q such that $q > p$ and $f(p) = f(q)$. Find the k_{th} smallest integer in Q.

Input

The first line of the input contains an integer T, the number of test cases. Then, for each test case, there is a line containing two space-separated integers, p and k.

It is guaranteed that p will not contain any leading zero.

Output

For each test case, print a line containing an integer — the k_{th} smallest integer in Q.

Scoring

For all subtasks, $1 \leq T \leq 10^3$.

- Subtask 1 (5 points): $0 \leq p < 10^6$, $k = 1$
- Subtask 2 (17 points): $0 \leq p < 10^{1000}$, $1 \leq k \leq 10^5$ and p will not contain 0 as a digit
- Subtask 3 (31 points): $0 \leq p < 10^{17}$, $1 \leq k \leq 10^9$
- Subtask 4 (47 points): $0 \leq p < 10^{1000}$, $1 \leq k \leq 10^9$

Example

standard input	standard output
5 0 1 0 9 0 10 1034 1 1034 100	20 200 202 1035 1407

Explanation

Some of the smallest integers x for which $f(x) = 1$ are: $0, 20, 30, 40, 50, 60, 70, 80, 90, 200, 202$ etc.