Problem J
Safe
Time Limit: 1 Second

An intelligence agency has obtained a locked safe containing secret documents. Attached to the safe is a sheet of paper containing two sequences of digits, X and Y, and k tables of operation costs. An intelligence analyst has discovered that the code to unlock the safe can be determined as follows.

Both X and Y consist of digits from 1 to 9, inclusive. Each cost table specifies the costs of three operations on a sequence of digits:

- **Replacement:** Replace one digit with another digit.
- **Insertion:** Insert a digit at any position.
- **Deletion:** Delete a digit from any position.

Each operation has a nonnegative integer cost. For a fixed cost table, let $\delta(A, B)$ denote the minimum total cost of transforming sequence A into sequence B using any number of these operations, including zero operations.

Each cost table is represented by a 10×10 matrix C. Its rows and columns are indexed, in order, by $1, 2, \ldots, 9, 0$, where 0 represents the empty symbol. The entries are interpreted as follows:

- For $1 \le a, b \le 9$, $C_{a,b}$ is the cost of replacing digit a with digit b.
- For $1 \le a \le 9$, $C_{a,0}$ is the cost of deleting digit a.
- For $1 \le b \le 9$, $C_{0,b}$ is the cost of inserting digit b.

The costs satisfy the following properties:

1. $C_{a,a} = 0$ for every $a \in \{1, 2, \ldots, 9, 0\}$.
2. $C_{a,b} = C_{b,a}$ for every $a, b \in \{1, 2, \ldots, 9, 0\}$.
3. $C_{a,c} \le C_{a,b} + C_{b,c}$ for every $a, b, c \in \{1, 2, \ldots, 9, 0\}$.

Now, partition Y into $p \ge 2$ nonempty contiguous subsequences $Y_1, Y_2, \ldots, Y_p$, such that $Y = Y_1 Y_2 \ldots Y_p$. For a fixed cost table C and a fixed partition, define the partition cost as $\max_{1 \le i \le p} \delta(X, Y_i)$. The candidate code for a cost table is the minimum partition cost over all possible choices of p and all valid partitions of Y.

Finally, the code required to unlock the safe is the minimum candidate code among the k cost tables.

For example, suppose $X = 12345$, $Y = 123412345642345$, and the three cost tables are as shown in the figure below.

X=12345, Y=123412345642345

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

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

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

For the first table, partitioning Y into 12341, 23456, and 42345 gives transformation costs 4, 5, and 3, respectively. The minimum possible partition cost for this table is 5.

For the second table, partitioning Y into 1234, 123456, and 42345 gives transformation costs 4, 4, and 4, respectively. The minimum possible partition cost for this table is 4.

For the third table, the same partition gives transformation costs 5, 4, and 3, respectively. The minimum possible partition cost for this table is 5.

Therefore, the code to unlock the safe is $\min\{5, 4, 5\} = 4$.

Given the two sequences X and Y and the k cost tables, write a program to determine the code to unlock the safe.

Input

Your program is to read from standard input. The first line contains two strings X and Y, followed by an integer k ($3 \leq |X| \leq 10$; $2|X| \leq |Y| \leq 10{,}000$; $2 \leq k \leq 100$). Both strings consist only of digits from 1 to 9, inclusive.

The next $10k$ lines describe the k cost tables, with 10 consecutive lines for each table. For each table, the i-th line contains 10 space-separated integers, representing the operation costs in the row corresponding to digit i for $1 \leq i \leq 9$, or to the empty symbol for $i = 10$. The columns correspond, in order, to digits $1, 2, \ldots, 9$, followed by the empty symbol. Each cost is an integer between 0 and 9, inclusive.

It is guaranteed that every cost table satisfies the properties stated above.

Output

Your program is to write to standard output. Print exactly one integer on a single line: the code required to unlock the safe.

The following shows partial sample inputs and their corresponding outputs for three test cases. The complete sample input and output files are available on the *DOMjudge Problemset* page.

Sample Input 1

```
12345 123412345642345 3
0 1 2 3 4 5 6 7 8 9
1 0 1 2 3 4 5 6 7 8
... (28 more lines)
```

Output for the Sample Input 1

```
4
```

Sample Input 2

```
598 499281 2
0 4 5 2 3 7 5 3 5 5
4 0 4 4 3 7 3 5 4 1
... (18 more lines)
```

Output for the Sample Input 2

```
8
```

Sample Input 3

```
5758 435198918 2
0 1 3 2 2 2 5 2 3 1
1 0 2 1 1 3 5 3 4 2
... (18 more lines)
```

Output for the Sample Input 3

```
8
```