

4012 Friend Numbers

Friend numbers are those who are composed of the same digits, for example 3123 and 11233233 are friend numbers, but 1233432 and 123331 are not friend numbers because in the second number the 4 is missing.

Your task is this: given an integer closed range $[A, B]$, an integer number N and an integer K , you must find the K -th friend number of N in that range.

Input

Input will consist of several test cases each of them in a separate line. For each test case you will receive four (with no leading zeroes) integers A , B , N and K ($0 < A \leq B < 10^{100}$, $0 \leq N \leq 10^{100}$, $0 < K \leq 10^{17}$).

Output

For each test case you must print a line containing a number representing the K -th friend number in the given range, or '-1' if it is not possible to obtain the K -th friend number.

Sample Input

```
1 191010100333 1003 20000
1 200 1 3
1 200 1 4
1 200 211 1
1 200 211 2
1 200 211 3
```

Sample Output

```
1010110131
111
-1
12
21
112
```