

C. Binary String Reconstruction

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Consider the following process. You have a binary string (a string where each character is either 0 or 1) w of length n and an integer x . You build a new binary string s consisting of n characters. The i -th character of s is chosen as follows:

- if the character w_{i-x} exists and is equal to 1, then s_i is 1 (formally, if $i > x$ and $w_{i-x} = 1$, then $s_i = 1$);
- if the character w_{i+x} exists and is equal to 1, then s_i is 1 (formally, if $i + x \leq n$ and $w_{i+x} = 1$, then $s_i = 1$);
- if both of the aforementioned conditions are false, then s_i is 0.

You are given the integer x and the resulting string s . Reconstruct the original string w .

Input

The first line contains one integer t ($1 \leq t \leq 1000$) — the number of test cases.

Each test case consists of two lines. The first line contains the resulting string s ($2 \leq |s| \leq 10^5$, each character of s is either 0 or 1). The second line contains one integer x ($1 \leq x \leq |s| - 1$).

The total length of all strings s in the input does not exceed 10^5 .

Output

For each test case, print the answer on a separate line as follows:

- if no string w can produce the string s at the end of the process, print -1 ;
- otherwise, print the binary string w consisting of $|s|$ characters. If there are multiple answers, print any of them.

Example

input	Copy
<pre>3 101110 2 01 1 110 1</pre>	
output	Copy
<pre>111011 10 -1</pre>	

Educational Codeforces Round 94 (Rated for Div. 2)

Contest is running

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Language: GNU G++17 7.3.0

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