Problem E. Cellular Automaton

Input file:	*standard input*
Output file:	*standard output*
Time limit:	1 second
Memory limit:	256 mebibytes

Let w be a positive integer and p be a string of length 2^{2w+1}. $(w, p)-$ cell automaton is defined as follows:

- The cells are arranged in an infinitely long 1-dimensional line.
- Each cell can take two states: 0 and 1.
- At time 0, Snuke chooses some (finite number of) cells and set their states to 1. He sets the states of other cells to 0.
- Let $f(t, x)$ be the state of the cell x at time $t(> 0)$. $f(t, x)$ is determined from $f(t-1, x-w), \cdots, f(t-1, x+w)$ according to the following rule:

$$f(t, x) = p[\sum_{i=-w}^{w} 2^{w+i} f(t-1, x+i)] \quad (1)$$

Snuke likes a cell automaton if the number of 1 doesn't change forever (no matter how he chooses the states at time 0). You are given an integer w and a string s. Compute the lexicographically minimal p such that $s \leq p$ and Snuke likes $(w, p)-$ cell automaton.

Input

First line of the input contains one integer w $(1 \leq w \leq 3)$. Next line contains string s ($|s| = 2^{2w+1}$, s consists of '0' and '1'.

Output

Print the minimal possible p. If there are no such strings, print "no" instead.

Examples

standard input	standard output
1 00011000	00011101
1 11111111	no