OLIMPIADA DE INFORMATICĂ ÎN ECHIPE

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Nest

On the vertices of a regular polygon N, birds have made their nests. The N vertices of the polygon have numbers from 0 to $N-1$ counterclockwise. Each bird sits on one nest. At a certain moment, the birds change their nests. In this way, we obtain a permutation $(c_0, c_1, c_2, \dots c_{N-1})$ where c_i represents the nest which will be later occupied by the bird that initially lived in the nest i. Because we want all the birds to make the same effort, the nests will be chosen in such a way that the distance between the initial nest i and the final one c_i should be the same for all the N birds.

We consider all the permutations $(c_0, c_1, c_2, \dots c_{N-1})$ obtained after the birds move and we order them lexicographically.

Task

Write a program that reads two natural numbers N and K and which displays the permutation situated on the position K, in lexicographic order, after arranging the permutations obtained as a result of the birds' movements. **ATENTION: the number K will be given in base 2.**

Input data

From the standard input, we will read, on the first line, the number N and on the second line a string of values 0 or 1 **non-separated by spaces,** representing the digits of the number K **written in base 2**.

Output data

At the standard output, there will be N distinct whole numbers, separated by a space, with values between 0 and $N-1$, representing the permutation situated on the position K, in lexicographic order, among all the possible permutations obtained after the birds move.

Constraints

- $1 \leq N \leq 1000000$
- **Make sure that for a given N, there are at least K possibilities for the movement of the birds.**

Examples

input	Output	*Explanation*
4 101	3 0 1 2	We have N=4 birds in 4 nests situated in the vertices of a square. They can move, respecting the conditions in the statement in 6 ways which, in lexicographic order, can be represented through the following permutations: 0 1 2 3 1 0 3 2 1 2 3 0 2 3 0 1 3 0 1 2 3 2 1 0 The number K has the representation 101 in base 2, so it has the value K=5 in base 10. We need the 5-th permutation in lexicographic order. This is 3 0 1 2

		Notice that: For the first permutation, the birds remain on the same spot, so all of them cover the distance 0. For the 4-th permutation, the birds situated in opposite vertices change their places between themselves and, in this way, all of them cover a distance which is equal to the diagonal of the square. For the other 4 permutations, each bird covers a distance equal to the side of the square.
5 11	2 3 4 0 1	We have 5 nests on the vertices of a regular pentagon. There are 5 possibilities for the birds to move. In lexicographic order, they are described by the following permutations: 0 1 2 3 4 1 2 3 4 0 2 3 4 0 1 3 4 0 1 2 4 0 1 2 3 The value of K in base 2 is 11 so K = 3. Notice that: For the first permutation, the birds stay in place, so they cover the distance 0. For the 2-nd and the 5-th, each bird covers a distance which is equal to the side of the pentagon. For the 3-rd and the 4-th, each bird covers a distance which is equal to the diagonal of the pentagon.

Maximum execution time/test: 0.1 seconds Total available memory 1 MB, out of which 1 MB for the stack.