B. The Child and Set

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

At the children's day, the child came to Picks's house, and messed his house up. Picks was angry at him. A lot of important things were lost, in particular the favorite set of Picks.

Fortunately, Picks remembers something about his set S:

- its elements were distinct integers from 1 to $limit$;
- the value of was equal to sum; here $lowbit(x)$ equals 2^k where k is the position of the first one in the binary representation of x. For example, $lowbit(10010_2) = 10_2$, $lowbit(10001_2) = 1_2$, $lowbit(10000_2) = 10000_2$ (binary representation).

Can you help Picks and find any set S, that satisfies all the above conditions?

Input

The first line contains two integers: sum, $limit$ $(1 \le sum, limit \le 10^5)$.

Output

In the first line print an integer n $(1 \le n \le 10^5)$, denoting the size of S. Then print the elements of set S in any order. If there are multiple answers, print any of them.

If it's impossible to find a suitable set, print `-1`.

Examples

input
5 5

output
2 4 5

input
4 3

output
3 2 3 1

input
5 1

output
-1

Note

In sample test 1: $lowbit(4) = 4$, $lowbit(5) = 1$, $4 + 1 = 5$.

In sample test 2: $lowbit(1) = 1$, $lowbit(2) = 2$, $lowbit(3) = 1$, $1 + 2 + 1 = 4$.