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 $\sum_{x \in S} lowbit(x)$ 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

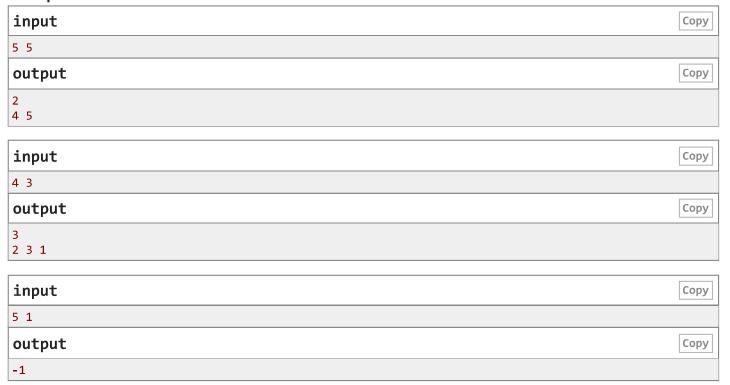
The first line contains two integers: sum, limit ($1 \le sum$, $limit \le 10^5$).

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



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.