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

input Copy

```
5 5
```

output Copy

```
2
4 5
```

input Copy

```
4 3
```

output Copy

```
3
2 3 1
```

input Copy

```
5 1
```

output Copy

```
-1
```

Note

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

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