Find the permutation

Consider a permutation, p_i, of integers from 1 to n. Let's determine the $distance$ of p_i to be the *minimum absolute difference* between any 2 consecutive integers in p_i:

$$distance(p_i) = \min_{0 \le j < n-1} | p_i[j] - p_i[j+1] | \text{ if } n > 1, \text{ or } 0 \text{ if } n = 1$$

Generate a lexicographically sorted list of all permutations of length n having a *maximal distance* between all permutations of the same length. Print the lexicographically k^{th} permutation.

Input Format

The first line contains an integer, t (the number of test cases).

The t subsequent lines each contain two space-separated integers, n_i (the permutation length) and k_i (the 1-based index in the list of permutations having a maximal distance), respectively. The i^{th} line corresponds to the i^{th} test case.

Note: It is guaranteed that the sum of all n_i does not exceed 10^6.

Constraints

- $1 \le t \le 10$
- $1 \le n_i \le 10^6$
- $1 \le k_i \le 10^{18}$

Output Format

For each test case: if the list of permutations having maximal distance has *at least* k elements, print the k^{th} permutation as sequential (i.e.: from 1 to n) space-separated integers on a new line; otherwise, print -1.

Sample Input

```
3
3 5
4 2
4 3
```

Sample Output

```
3 1 2
3 1 4 2
-1
```

Explanation

For $n = 3$ and $k = 5$:
$p_1 = [1,2,3]; distance(p_1) = min(\ |1-2|, |2-3|\ ) = min(1,1) = 1$
$p_2 = [1,3,2]; distance(p_2) = min(\ |1-3|, |3-2|\ ) = min(2,1) = 1$
$p_3 = [2,1,3]; distance(p_3) = min(\ |2-1|, |1-3|\ ) = min(1,2) = 1$
$p_4 = [2,3,1]; distance(p_4) = min(\ |2-3|, |3-1|\ ) = min(1,2) = 1$
$p_5 = [3,1,2]; distance(p_5) = min(\ |3-1|, |1-2|\ ) = min(2,1) = 1$
$p_6 = [3,2,1]; distance(p_6) = min(\ |3-2|, |2-1|\ ) = min(1,1) = 1$

Each of the 6 permutations has distance 1. We choose the fifth one (because $k = 5$), and print `3 1 2` on a

new line.

For $n = 4$ and $k = 2$:
The maximal distance in the list of permutations of integers from 1 to 4 is 2, and the only permutations having that distance are $P_{11} = [2, 4, 1, 3]$ and $P_{14} = [3, 1, 4, 2]$. We choose the second one (because $k = 2$), and print `3 1 4 2` on a new line.