



Find the permutation

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Problem

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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 :

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

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

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

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 $k = 5$:

$p_1 = [1, 2, 3]$; $\text{distance}(p_1) = \min(|1 - 2|, |2 - 3|) = \min(1, 1) = 1$

$p_2 = [1, 3, 2]$; $\text{distance}(p_2) = \min(|1 - 3|, |3 - 2|) = \min(2, 1) = 1$

$p_3 = [2, 1, 3]; \text{distance}(p_3) = \min(|2 - 1|, |1 - 3|) = \min(1, 2) = 1$
 $p_4 = [2, 3, 1]; \text{distance}(p_4) = \min(|2 - 3|, |3 - 1|) = \min(1, 2) = 1$
 $p_5 = [3, 1, 2]; \text{distance}(p_5) = \min(|3 - 1|, |1 - 2|) = \min(2, 1) = 1$
 $p_6 = [3, 2, 1]; \text{distance}(p_6) = \min(|3 - 2|, |2 - 1|) = \min(1, 1) = 1$

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.

f t in

Submissions: 75



Max Score: 150



Difficulty: Expert

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Java 7  

```

1 import java.io.*;
2 import java.util.*;
3 import java.text.*;
4 import java.math.*;
5 import java.util.regex.*;
6
7 public class Solution {
8
9     public static void main(String[] args) {
10         /* Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution. */
11     }
12 }

```

Line: 1 Col: 1

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