

## 12480 Just Some Permutations

Dexter considers a permutation of first  $N$  positive numbers  $(1, 2, \dots, N)$  **beautiful** if all the absolute differences between **adjacent numbers** in the permutation are distinct.

So for  $N = 4$ :  $\{3, 2, 4, 1\}$  is a **beautiful** permutation because the absolute differences are  $\{1, 2, 3\}$ . But  $\{3, 1, 4, 2\}$  is not **beautiful** since the absolute differences  $\{2, 3, 2\}$  are not distinct.

Given  $N$  and  $K$  find the lexicographically  $K$ -th smallest beautiful permutation of the first  $N$  positive numbers. A permutation of  $N$  numbers  $A_1, A_2, \dots, A_n$  is lexicographically smaller than another permutation  $B_1, B_2, \dots, B_n$  if  $A_i < B_i$  for some  $i$  and  $A_j = B_j$  for all  $j < i$ .

### Input

First line of the input contains an integer  $T$  ( $\leq 1000$ ) which is the number of test cases. Each of the next  $T$  lines contain two space separated integers  $N$  ( $1 < N < 20$ ) and  $K$  ( $1 \leq K \leq 10^9$ ).

### Output

For each test case output the case number and then  $N$  space separated integers which is the lexicographically  $K$ -th smallest beautiful permutation of first  $N$  positive numbers. If there are less than  $K$  beautiful permutations then output '-1'. See sample output for exact formatting.

### Sample Input

```
4
5 1
5 2
5 4
5 10
```

### Sample Output

```
Case 1: 1 5 2 4 3
Case 2: 2 3 5 1 4
Case 3: 3 2 4 1 5
Case 4: -1
```