PLAYING WITH BITS

The problem is very *simple*.

You are given a even number **N** and an integer **K** and you have to find the greatest odd number **M** less than **N** such that the sum of digits in binary representation of **M** is atmost **K**.

Input

For each testcase

You are given an even number **N** and an integer **K**

Output

For each test case, output the integer **M** if it exists, else print **-1**

Constraints

1<=**T**<=10^4

2<=**N**<=10^9

0<=**K**<=30

Example

Input:
2
10 2
6 1

Output:
9
1

Explanation

First case when *N*=10 *K*=2

Binary representaion of **10** is *1010* and binary representation of **9** is *1001* , hence greatest odd number less than **10** whose sum of digits in its binary representation is atmost **2** is **9**. Hence *output* is **9**