Toby was behaving badly at little dog school and his teacher grounded him by asking him to solve a hard problem. Toby is given a number N, let's consider a set S of all binary strings of N bits. Let's also consider any subset P_i of S, let $XOR(P_i)$ be the `XOR` of all the elements of P_i. The `XOR` of the empty set is a binary string of N zeros.

As Toby is a very smart dog, and Toby's teacher wants Toby to spend a very long time working on the problem, he asks:

How many different subsets P_i of S exist such than $XOR(P_i)$ has exactly K ones?

Recall that the empty set and S itself are valid subsets of S.

Input

The input consist of several test cases. Each test case consists of a line containing the numbers N and K. The end of the test cases is given by the end of file (EOF).

- $1 \leq K \leq N \leq 10^6$

Output

For each test case print the requested answer *modulo* $p = 10^9 + 7$.

Explication:

For the first test case the subsets of the strings of 2 bits with an XOR with zero ones is: {}, {00}, {01, 10, 11} and {00, 01, 10, 11}

For the second test case the subsets of the strings of 1 bit with an XOR with one is: {1}, {0, 1}

Sample Input

```
2 0
1 1
```

Sample Output

```
4
2
```