Just Add It

For two given integers n and k find $(Z_n + Z_{n-1} - 2Z_{n-2}) \bmod 10000007$, where $Z_n = S_n + P_n$ and $S_n = 1^k + 2^k + 3^k + \ldots + n^k$ and $P_n = 1^1 + 2^2 + 3^3 + \ldots + n^n$.

Input

There are several test cases (≤ 10000). In each case two space separated positive integers n and k are given.
For last test case n and k are given as 0 0, which is not to be processed.

Constraints

$1 < n < 200000000$
$0 < k < 1000000$

Output

For each case print the asked value in separate line.

Example

Input:
10 3
9 31
83 17
5 2
0 0

Output:
4835897
2118762
2285275
3694