Sum of Powers

Given two integers N and K you have to calculate:

$$\sum_{i=1}^{i=n} i^k$$

Input

The first line of the input is T ($1 <= T <= 10^5$), the number of test cases each test case in one line.

then T lines each line consist of N ($1 <= N <= 10^{18}$) and K ($0 <= K <= 5$)

Output

print the answer modulo 100,000,007 ($10^8 + 7$)

Example

Input:
3

5 2

1 5

10 3

Output:
55

1

3025