1132 – Summing up Powers

Given **N** and **K**, you have to find

$$(1^K + 2^K + 3^K + ... + N^K) \% 2^{32}$$

Input

Input starts with an integer **T (≤ 200)**, denoting the number of test cases.

Each case contains two integers **N ($1 \le N \le 10^{15}$)** and **K ($0 \le K \le 50$)** in a single line.

Output

For each case, print the case number and the result.

Sample Input	Output for Sample Input
3 3 1 4 2 3 3	Case 1: 6 Case 2: 30 Case 3: 36