1065 – Number Sequence

Let's define another number sequence, given by the following function:

f(0) = a
f(1) = b
f(n) = f(n-1) + f(n-2), n > 1

When **a = 0** and **b = 1**, this sequence gives the Fibonacci sequence. Changing the values of **a** and **b**, you can get many different sequences. Given the values of **a, b**, you have to find the last **m** digits of **f(n)**.

Input

Input starts with an integer **T (≤ 10000)**, denoting the number of test cases.

Each test case consists of a single line containing four integers **a b n m**. The values of **a** and **b** range in **[0,100]**, value of **n** ranges in **[0, 10^9]** and value of **m** ranges in **[1, 4]**.

Output

For each case, print the case number and the last **m** digits of **f(n)**. However, do **NOT** print any leading zero.

Sample Input	Output for Sample Input
4 0 1 11 3 0 1 42 4 0 1 22 4 0 1 21 4	Case 1: 89 Case 2: 4296 Case 3: 7711 Case 4: 946