1131 – Just Two Functions

Let

$$f_n = a_1 * f_{n-1} + b_1 * f_{n-2} + c_1 * g_{n-3}$$

$$g_n = a_2 * g_{n-1} + b_2 * g_{n-2} + c_2 * f_{n-3}$$

Find f_n **% M** and g_n **% M**. (% stands for the modulo operation.)

Input

Input starts with an integer **T (≤ 50)**, denoting the number of test cases.

Each case starts with a blank line. Next line contains three integers a_1 b_1 c_1 **(0 ≤ a_1, b_1, c_1 < 25000)**. Next line contains three integers a_2 b_2 c_2 **(0 ≤ a_2, b_2, c_2 < 25000)**. Next line contains three integers f_0 f_1 f_2 **(0 ≤ f_0, f_1, f_2 < 25000)**. Next line contains three integers g_0 g_1 g_2 **(0 ≤ g_0, g_1, g_2 < 25000)**. The next line contains an integer **M (1 ≤ M < 25000)**.

Next line contains an integer **q (1 ≤ q ≤ 100)** denoting the number of queries. Next line contains **q** space separated integers denoting **n**. Each of these integers is non-negative and less than 2^{31}.

Output

For each case, print the case number in a line. Then for each query, you have to print one line containing f_n **% M** and g_n **% M**.

Sample Input	Output for Sample Input
2 1 1 0 0 0 0 0 1 1 0 0 0 20000 10 1 2 3 4 5 6 7 8 9 10 1 1 1 1 1 1 2 2 2 2 2 2 20000 5 2 4 6 8 10	Case 1: 1 0 1 0 2 0 3 0 5 0 8 0 13 0 21 0 34 0 55 0 Case 2: 2 2 10 10 34 34 114 114 386 386