**Manganese Dioxide**

**Time Limit: Memory Limit: 256MB**

Manganese Dioxide (chemical formula MnO2) is a blackish or brown solid. Although looking harsh, its properties are wonderful and popularly used in batteries. Similarly, this problem may look difficult, but its solution contains beautiful insights. Let’s see if it’s true!

Given an array of integers , and an integer . For every , calculate the sum of their i-th powers: .

**Input:**

The first line contains two natural numbers,

The second line contains real numbers . Each of them has at most 3 decimal digits in the input.

**Output:**

Print lines, containing , each on one line. Since they may be too big, print them after taking modulo 998244353.

**Sample 1:**

|  |  |
| --- | --- |
| 3 3  1 2 3 | 6  14  36 |

**Sample 2:**

|  |  |
| --- | --- |
| 4 5  87 535 808 5026 | 6456  26207334  864427735  110742109  992865564 |

**Explanation:**

In sample 1,

**Bonus:** Find out what MnO2 facts that correspond to numbers in sample 2. Good luck!