

Problem L. Village Planning

Input file: *standard input*
Output file: *standard output*
Time limit: 4 seconds
Memory limit: 1024 mebibytes

As the mayor of the RUN town, you are planning to build a new village. The village consists of houses and bidirectional roads connecting two different houses. Roads are organized in such a way that no two roads connect the same pair of houses. In other words, the village can be treated as a simple graph where houses corresponds to vertices and roads corresponds to bidirectional edges. Note that the village may be disconnected.

You want your village to be as simple as possible. Therefore, for any distinct houses i and j , there should be at most K simple paths from house i to house j .

Let N be the number of houses. The score of the village is

$$\prod_{1 \leq i < j \leq N} A_{f(i,j)},$$

where $f(i, j)$ is the number of simple paths from house i to house j .

While the number of houses is not determined yet, you know that it will be an integer between 2 and M . You should calculate the sum of the scores for all possible villages with N houses for each N from 2 to M .

Since the answers can be large, output them modulo 998 244 353.

Input

The first line contains two space-separated integers M and K .

The second line contains $K + 1$ space-separated integers A_0, \dots, A_K .

- $2 \leq M \leq 100\,000$
- $0 \leq K \leq 3$
- $1 \leq A_i < 998\,244\,353$ ($0 \leq i \leq K$)

Output

For each N from 2 to M , output the sum of the scores for all possible villages with N houses, modulo 998 244 353. The answers should be separated by single spaces. Note that $998\,244\,353 = 119 \cdot 2^{23} + 1$ is a prime number.

Examples

<i>standard input</i>	<i>standard output</i>
4 0 2	2 8 64
5 1 3 4	7 327 96721 169832849
6 2 5 6 7	11 1566 3000672 306031599 466869291
7 3 8 9 10 11	17 5427 31856976 326774674 449014006 997476587