

Kingdom of Construction

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 1024 megabytes

Given a sequence of length n , a_1, a_2, \dots, a_n , you need to construct an $n \times n$ matrix A such that for any two sets $S \subseteq S' \subseteq [n]$,

$$\det(A_{S'}) - \det(A_S) \equiv \left(\sum_{i \in S'} a_i - \sum_{i \in S} a_i \right) \pmod{998\,244\,353}.$$

Here $[n]$ denotes the set $\{1, 2, \dots, n\}$, and $\det(A)$ denotes the determinant of A . For a subset $T \subseteq [n]$, A_T denotes the principal submatrix of A formed by rows and columns with indices in T . By convention, $\det(A_\emptyset) = 1$.

Input

There is only one test case in each test file.

The first line contains an integer n ($1 \leq n \leq 18$), denoting the length of the sequence.

The second line contains n integers a_1, a_2, \dots, a_n ($0 \leq a_i < 998244353$), representing the elements of the sequence.

Output

Output n lines, with the i -th line containing n integers $A_{i,1}, A_{i,2}, \dots, A_{i,n}$ ($0 \leq A_{i,j} < 998244353$), representing the matrix A you constructed.

Example

standard input	standard output
2	7 12
6 8	4 9