

Problem G. Mismatch

Input file: *standard input*
Output file: *standard output*
Time limit: 4 seconds
Memory limit: 512 mebibytes

You are given an array a_1, a_2, \dots, a_n of n nonnegative integers. For each k from 1 to n , find the number of subsequences of size k ($a_{i_1}, a_{i_2}, \dots, a_{i_k}; 1 \leq i_1 < \dots < i_k \leq n$) such that their bitwise AND is equal to zero ($a_{i_1} \wedge a_{i_2} \wedge \dots \wedge a_{i_k} = 0$). Since the answers can be very large, compute them modulo 998 244 353.

Two subsequences are considered distinct if there is an index i such that the element a_i is included in one of the subsequences but not the other.

Input

The first line contains an integer n ($1 \leq n \leq 2^{19}$). The second line contains n integers a_1, a_2, \dots, a_n ($0 \leq a_i < 2^{19}$).

Output

Print n space-separated integers b_1, b_2, \dots, b_n , where b_i is the answer for $k = i$ modulo 998 244 353.

Examples

| <i>standard input</i> | <i>standard output</i> |
|-----------------------|------------------------|
| 3 0 1 2 | 1 3 1 |
| 6 1 2 2 7 6 7 | 0 3 9 10 5 1 |