

Maximum Matching Pairs

Input file: **standard input**
Output file: **standard output**
Time limit: 1.5 seconds
Memory limit: 256 megabytes

Given an array of n integers a_1, a_2, \dots, a_n and q queries. For each query with parameter k , determine the maximum number of disjoint pairs $(i, j) (i \neq j)$ that can be formed such that $a_i + a_j \leq k$. Each element can be used in at most one pair.

You should answer the questions **online**.

Input

The first line contains a single integer T ($1 \leq T \leq 10^3$) – the number of test cases.

For each test case:

- The first line contains two integers n and q ($1 \leq n \leq 10^4$, $1 \leq q \leq 5 \cdot 10^5$) – the number of elements and the number of queries.
- The second line contains n integers a_1, a_2, \dots, a_n ($0 \leq a_i < 2^{30}$).
- Each of the next q lines contains a single integer k' ($0 \leq k' < 2^{31}$) representing a query. The actual query parameter k should be computed as: $k = k' \oplus last_ans$ ($0 \leq k < 2^{31}$) where:
 - \oplus denotes the bitwise XOR operation
 - $last_ans$ is the answer to the previous query (initialized to 0)

It is guaranteed that the sum of n across all test cases does not exceed 10^4 , and the sum of q across all test cases does not exceed $5 \cdot 10^5$.

Output

For each test case, output q lines – the answers to the queries in the order they were given.

Example

standard input	standard output
2	1
5 6	1
1 3 7 9 12	1
5	1
7	1
6	2
9	2
8	2
11	2
6 4	3
7 12 15 19 22 27	
27	
28	
35	
38	

Note

The queries to two test cases are [5, 6, 7, 8, 9, 10] and [27, 30, 33, 36] respectively.