G Extreme XOR Sum

Input: Standard Input
Output: Standard Output

Imagine you have an array of **n** integers **a = [a_0, a_1, a_2, ..., a_{n-1}]**. To find the **extreme sum** of them you have to do the following operations:

1. Create a new list **t = [$a_0 + a_1$, $a_1 + a_2$, ..., $a_{n-2} + a_{n-1}$]**.
2. Let **a = t.**
3. If **a** has only one element remaining, exit. Otherwise go to **1**.

The last remaining element is the extreme sum for the given array. Extreme sum for **a = [1, 2, 4]** is **9**.

To find the extreme XOR Sum, you have to do **XOR operation** instead of addition operation (in the step **1** above).

You are given an array of integers **a**. You have to answer **q** queries. Each query has the form of **b e**. You have to find the extreme XOR sum of the array **[a_b, a_{b+1}, a_{b+2} ... a_e]**.

Input

The first line contains **T (1 ≤ T ≤ 25)**. For each test case:

- The first line contains **n (1 ≤ n ≤ 10^4)**.
- The second line contains **n** integers denoting the array **a**. Each element of the array will be an integer between **0** and **10^9**.
- The third line contains **q (1 ≤ q ≤ 30000)**.
- Each of the next **q** lines contains two integers **b** and **e (0 ≤ b ≤ e < n)**.

Output

For each test case, print the case number in the first line. In the next ***q*** lines, print a single line, the extreme XOR sum for the range **[b, e]** for the corresponding query.

Sample Input

```
1
5
1 4 6 7 8
3
0 0
0 1
2 4
```

Output for Sample Input

```
Case 1:
1
5
14
```