

## 7639 Extreme XOR Sum

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

1. Create a new list  $t = [a_0 + a_1, a_1 + a_2, \dots, a_{n-2} + a_{n-1}]$ .
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  $[a_b, a_{b+1}, a_{b+2} \dots a_e]$ .

### Input

The first line contains  $T$  ( $1 \leq T \leq 25$ ). For each test case:

- The first line contains  $n$  ( $1 \leq n \leq 10^4$ ).
- 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  $q$  ( $1 \leq q \leq 30000$ ).
- Each of the next  $q$  lines contains two integers  $b$  and  $e$  ( $0 \leq b \leq e < n$ ).

### 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
```

### Sample Output

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