XOR love

Devendra loves the XOR operation very much which is denoted by $\wedge$ sign in most of the programming languages. He has a list A of N numbers and he wants to know the answers of M queries. Each query will be denoted by three numbers i.e. K, P, R .

For query K, P and R, he has to print the value of the $KPRsum$ which can be described as given below. As the value of the $KPRsum$ can be large. So, print it modulus $(10^9 + 7)$.

$$KPRsum = \sum_{i=P}^{R-1} \sum_{j=i+1}^{R} (K \oplus (A[i] \oplus A[j]))$$

Input Format

The first line contains an integer N, i.e., the number of the elements in the list. List is numbered from 1 to N.
Next line will contain N space seperated integers.
Third line will contain a number M i.e. number of queries followed by M lines each containing integers $K, P\&R$.

Output Format

Print M lines, i^{th} line will be answer of i^{th} query. **Answer will be 0 in case of P=R.**

Constraints

$1 \leq N \leq 10^5$
$1 \leq A[i] \leq 10^6$
$1 \leq M \leq 10^5$
$0 \leq K \leq 10^6$
$1 \leq P \leq R \leq N$

Sample Input

```
3
1 2 3
2
1 1 3
2 1 3
```

Sample Output

```
5
4
```

Explanation

For first query, it will will be

$$(1 \oplus (1 \oplus 2)) + (1 \oplus (1 \oplus 3)) + (1 \oplus (2 \oplus 3)) = 5$$