Maximum Xor

HackerRank

You are given an array arr of n elements. A list of integers, $queries$ is given as an input, find the maximum value of $queries[j] \oplus \text{ each } arr[i]$ for all $0 \leq i < n$, where $\oplus$ represents xor of two elements.

Note that there are multiple test cases in one input file.

For example:

$arr = [3, 7, 15, 10]$

$queries[j] = 3$
$3 \oplus 3 = 0, \max = 0$
$3 \oplus 7 = 4, \max = 4$
$3 \oplus 15 = 12, \max = 12$
$3 \oplus 10 = 9, \max = 12$

Function Description

Complete the *maxXor* function in the editor below. It must return an array of integers, each representing the maximum xor value for each element $queries[j]$ against all elements of arr.

maxXor has the following parameter(s):

- *arr*: an array of integers
- *queries*: an array of integers to query

Input Format

The first line contains an integer n, the size of the array arr.

The second line contains n space-separated integers, $arr[i]$ from $0 \leq i < n$.

The third line contain m, the size of the array $queries$.

Each of the next m lines contains an integer $queries[j]$ where $0 \leq j < m$.

Constraints

$1 \leq n, m \leq 10^5$

$0 \leq arr[i], queries[j] \leq 10^9$

Output Format

The output should contain m lines with each line representing output for the corresponding input of the testcase.

Sample Input 0

```
3
0 1 2
3
3
7
2
```

Sample Output 0

```
3
7
3
```

Explanation 0

$arr = [0, 1, 2]$

$queries[0] = 3$
$3 \oplus 0 = 3, max = 3$
$3 \oplus 1 = 2, max = 3$
$3 \oplus 2 = 1, max = 3$

$queries[1] = 7$
$7 \oplus 0 = 7, max = 7$
$7 \oplus 1 = 6, max = 7$
$7 \oplus 2 = 5, max = 7$

$queries[2] = 2$
$2 \oplus 0 = 2, max = 2$
$2 \oplus 1 = 3, max = 3$
$2 \oplus 2 = 0, max = 3$

Sample Input 1

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

Sample Output 1

```
7
7
```

Explanation 1

$arr = [5, 1, 7, 4, 3]$

$queries[0] = 2$
$2 \oplus 5 = 7, max = 7$
$2 \oplus 1 = 3, max = 7$

$2 \oplus 7 = 5, max = 7$
$2 \oplus 4 = 6, max = 7$
$2 \oplus 3 = 1, max = 7$

$queries[1] = 0$
$0 \oplus 5 = 5, max = 5$
$0 \oplus 1 = 1, max = 5$
$0 \oplus 7 = 7, max = 7$
$0 \oplus 4 = 4, max = 7$
$0 \oplus 3 = 3, max = 7$

Sample Input 2

```
4
1 3 5 7
2
17
6
```

Sample Output 2

```
22
7
```

Explanation 2

$arr = [1, 3, 5, 7]$

$queries[0] = 17$
$17 \oplus 1 = 16, max = 16$
$17 \oplus 3 = 18, max = 18$
$17 \oplus 5 = 20, max = 20$
$17 \oplus 7 = 22, max = 22$

$queries[1] = 6$
$6 \oplus 1 = 7, max = 7$
$6 \oplus 3 = 5, max = 7$
$6 \oplus 5 = 3, max = 7$
$6 \oplus 7 = 1, max = 7$