

## F. Xors on Segments

time limit per test: 10 seconds  
 memory limit per test: 512 megabytes  
 input: standard input  
 output: standard output

You are given an array with  $n$  integers  $a_i$  and  $m$  queries. Each query is described by two integers  $(l_j, r_j)$ .

Let's define the function  $f(u, v) = u \oplus (u + 1) \oplus \dots \oplus v$ . The function is defined for only  $u \leq v$ .

For each query print the maximal value of the function  $f(a_x, a_y)$  over all  $l_j \leq x, y \leq r_j, a_x \leq a_y$ .

### Input

The first line contains two integers  $n, m$  ( $1 \leq n \leq 5 \cdot 10^4, 1 \leq m \leq 5 \cdot 10^3$ ) — the size of the array and the number of the queries.

The second line contains  $n$  integers  $a_i$  ( $1 \leq a_i \leq 10^6$ ) — the elements of the array  $a$ .

Each of the next  $m$  lines contains two integers  $l_j, r_j$  ( $1 \leq l_j \leq r_j \leq n$ ) — the parameters of the  $j$ -th query.

### Output

For each query print the value  $a_j$  on a separate line — the maximal value of the function  $f(a_x, a_y)$  over all  $l_j \leq x, y \leq r_j, a_x \leq a_y$ .

### Examples

| input                                                       |
|-------------------------------------------------------------|
| 6 3<br>1 2 3 4 5 6<br>1 6<br>2 5<br>3 4                     |
| output                                                      |
| 7<br>7<br>7                                                 |
| input                                                       |
| 1 1<br>1<br>1 1                                             |
| output                                                      |
| 1                                                           |
| input                                                       |
| 6 20<br>10 21312 2314 214 1 322<br>1 1<br>1 2<br>1 3<br>1 4 |

### Educational Codeforces Round 6

Finished

Practice



### → Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ACM-ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

### → Practice

You are registered for practice. You can solve problems unofficially. Results can be found in the contest status and in the bottom of standings.

### → Submit?

Language: GNU G++ 5.1.0 ▼

Choose file: Choose File No file chosen

Submit

### → Problem tags

data structures

No tag edit access

### → Contest materials

- Announcement ✕
- Tutorial ✕

```
1 5
1 6
2 2
2 3
2 4
2 5
2 6
3 4
3 5
3 6
4 4
4 5
4 6
5 5
5 6
6 6
```

#### output

```
10
21313
21313
21313
21313
21313
21312
21313
21313
21313
21313
2314
2315
2315
214
215
323
1
323
322
```