

Problem K. Vali

Input file `stdin`
Output file `stdout`

Task

You are given a number n and an array A of n elements. You are also given q queries. Each query is one of the following two types:

- **1 l r x**: For each i from l to r , apply the operation: $A[i] \leftarrow A[i] \oplus (x + i - l)$
- **2 l r**: Output the maximum value in the subarray $A[l..r]$

Input Data

Data is read from standard input.

The first line contains two integers n and q .

The second line contains n integers, representing the array A .

Each of the following q lines describes a query, either of type **1 l r x** or **2 l r**.

Output Data

For each query of type 2, output a single line with the maximum value found in the specified range.

Constraints

- $1 \leq n, q \leq 10^5$
- $0 \leq A[i], x \leq 10^9$
- $1 \leq l \leq r \leq n$

Examples

Input file	Output file
5 3 1 2 3 4 5 1 2 4 1 2 1 5 2 2 3	7 3