XOR Division

You are given an array a of n integers: $a[1], a[2], \ldots, a[n]$. You have to modify the array **exactly once** using the following steps:

- Select an integer k between 0 and n.
- Select exactly k indices $c_1, c_2, \ldots, c_k$ such that $1 \leq c_1 < c_2 < \ldots < c_k \leq n$.
- Delete the elements $a[c_1], a[c_2], \ldots, a[c_k]$.

After performing the modification, you will end up with $k+1$ disjoint contiguous sub-arrays $S_1, S_2, \ldots, S_{k+1}$ (some possibly empty) of the initial array a. Precisely, if we let $c_0 = 0$ and $c_{k+1} = n+1$, for ease of explanation, then the sub-array S_i (for all $1 \leq i \leq k+1$) consists of the elements $a[c_{i-1}+1], a[c_{i-1}+2], \ldots, a[c_i - 1]$. Note that, as hinted earlier, the sub-array S_i will be empty whenever $c_{i-1} + 1 = c_i$.

The *score* of a sub-array is the **bitwise exclusive OR** (XOR) of the elements of the sub-array. The *reward* for the modification of the array is the **sum** of the scores of the individual sub-arrays. Formally,

$$\text{Reward} = \sum_{i=1}^{k+1} \left(\bigoplus_{u \in S_i} u \right).$$

For example, Suppose $a = [5, 2, 5, 3, 9, 6, 10]$. If we delete elements at indices $1, 4$, and 6, then the array becomes $[\cancel{5}, 2, 5, \cancel{3}, 9, \cancel{6}, 10]$, and $S_1 = []$, $S_2 = [2, 5]$, $S_3 = [9]$, and $S_4 = [10]$. Hence the reward for this modification will be $0 + (2 \oplus 5) + 9 + 10 = 26$

Your task is to find the **maximum** possible reward for modifying the array.

Input

Read the input from the standard input in the following format:

- line 1: n
- line 2: $a[1]$ $a[2]$ $\ldots$ $a[n]$

Output

Write the output to the standard output in the following format:

- line 1: the maximum possible reward.

Constraints

- $1 \leq n \leq 500\ 000$
- $0 \leq a[i] \leq 10^{12}$ (for all $1 \leq i \leq n$)

Subtasks

1. (5 points) $1 \leq n \leq 20$
2. (19 points) $1 \leq n \leq 5000$
3. (8 points) $0 \leq a[i] \leq 1$ (for all $1 \leq i \leq n$)
4. (21 points) $a[i] \leq a[i+1]$ (for all $1 \leq i < n$)
5. (47 points) No further constraints.

Examples

Example 1

```
7
5 2 5 3 9 6 10
```

The correct output is:

```
30
```

Deleting the elements at indices 2 and 6 gives the maximum reward: $5 + (5 \oplus 3 \oplus 9) + 10 = 30$.

Example 2

```
3
2 6 3
```

The correct output is:

```
7
```

No elements should be deleted to achieve the maximum possible reward: $2 \oplus 6 \oplus 3 = 7$.