

## Problem H

### Alchembit Exam

As a modern alchemy student, you are taking an exam in Alchembit, a hybrid between alchemy and modern technology. In the exam, you are given  $N$  potions (numbered from 1 to  $N$ ) where potion  $i$  has a potency of an integer  $A_i$ . You start the exam with a score of 0.

You can increase your score by doing the following procedure.

1. Suppose there are  $n$  potions remaining. Choose an interval  $[l, r]$  where  $1 \leq l < r \leq n$ .
2. By choosing the interval  $[l, r]$ , your score will be increased by  $A_l \& A_{l+1} \& \dots \& A_r$ , where the symbol  $\&$  represents the bitwise AND operator.
3. Next, fuse potions  $l, l+1, \dots, r$  into one new potion with a potency of  $A_l \& A_{l+1} \& \dots \& A_r$ .
4. The potions are then renumbered as follows: the newly fused potion becomes potion  $l$ , and potions  $r+1, r+2, \dots, n$  are renumbered as  $l+1, l+2, \dots, l+(n-r)$ . Potions numbered  $1, 2, \dots, l-1$  remain unchanged.

For example, if you have 5 potions with potencies  $A = [19, 12, 10, 20, 23]$ , and you choose interval  $[2, 3]$ , then your score will be increased by  $12 \& 10 = 8$ . Then, potions 2 and 3 are fused into a new potion with a potency of  $12 \& 10 = 8$ . After the renumbering procedure (step 4),  $A$  becomes  $[19, 8, 20, 23]$ .

You can perform the above procedure until there is only one potion left. Determine the maximum score that you can achieve.

#### Input

The first line consists of an integer  $N$  ( $2 \leq N \leq 100\,000$ ).

The second line consists of  $N$  integers  $A_i$  ( $0 \leq A_i < 2^{30}$ ).

#### Output

Output a single integer representing the maximum score that you can get.

#### Sample Input #1

```
5
19 12 10 20 23
```

#### Sample Output #1

```
28
```

*Explanation for the sample input/output #1*

First, choose the interval  $[2, 3]$  so that your score is increased by  $12 \& 10 = 8$ , and  $A$  becomes  $[19, 8, 20, 23]$ .  
Next, choose the interval  $[3, 4]$  so that your score is increased by  $20 \& 23 = 20$ , and  $A$  becomes  $[19, 8, 20]$ .  
Finally, choose the interval  $[1, 3]$  so that your score is increased by  $19 \& 8 \& 20 = 0$ , and  $A$  becomes  $[0]$ .

**Sample Input #2**

```
4
1000000000 1000000000 1000000000 1000000000
```

**Sample Output #2**

```
3000000000
```