

# Beautiful Segments

You are given an array,  $A$ , consisting of  $N$  integers.

A segment,  $[l, r]$ , is *beautiful* if and only if the *bitwise AND* of all numbers in  $A$  with indices in the inclusive range of  $[l, r]$  is not greater than  $X$ . In other words, segment  $[l, r]$  is *beautiful* if  $(A_l \wedge A_{l+1} \wedge \dots \wedge A_r) \leq X$ .

You must answer  $Q$  queries. Each query,  $Q_j$ , consists of 3 integers:  $L_j$ ,  $R_j$ , and  $X_j$ . The answer for each  $Q_j$  is the number of *beautiful* segments  $[l, r]$  such that  $L_j \leq l \leq r \leq R_j$  and  $X = X_j$ .

## Input Format

The first line contains two space-separated integers,  $N$  (the number of integers in  $A$ ) and  $Q$  (the number of queries).

The second line contains  $N$  space-separated integers, where the  $i^{th}$  integer denotes the  $i^{th}$  element of array  $A$ .

Each line  $j$  of the  $Q$  subsequent lines contains 3 space-separated integers,  $L_j$ ,  $R_j$ , and  $X_j$ , respectively, describing query  $Q_j$ .

## Constraints

- $1 \leq N \leq 4 \times 10^4$
- $1 \leq Q \leq 10^5$
- $1 \leq L_j \leq R_j \leq N$
- $0 \leq X_j \leq 2^{17}$
- $0 \leq A_i < 2^{17}$
- $1 \leq N, Q \leq 2000$  holds for test cases worth at least 10% of the problem's score.
- $0 \leq A_i < 2^{11}$  holds for test cases worth at least 40% of the problem's score.

## Output Format

Print  $Q$  lines, where the  $j^{th}$  line contains the number of beautiful segments for query  $Q_j$ .

## Sample Input

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

## Sample Output

```
13
5
2
```

## Explanation

The beautiful segments for all queries are listed below.

*Query 0:* The beautiful segments are

$[1, 1], [1, 2], [1, 3], [1, 4], [1, 5], [2, 2], [2, 3], [2, 4], [2, 5], [3, 4], [3, 5], [4, 4], [4, 5]$  .

*Query 1:* The beautiful segments are  $[2, 2], [2, 3], [2, 4], [3, 4], [4, 4]$  .

*Query 2:* The beautiful segments are  $[3, 5], [4, 5]$  .