

Ugly Bit: Ramanujan's Favourite

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Great mathematician **S. Ramanujan**, was very friendly finding relations in between numbers, again binary representation of number is plays for **solving prime numbers in huge range**. Now one day, he fascinated in finding **Ugly bits in binary**. He tells the rule as follows:

A number is **known as** Ugly bit number, if its **binary representation contains at least two consecutive 1's** or set bits.

[N:B:]: For example with binary representation is a Ugly bit number. Similarly is also a Ugly bit number as it contains at least **two consecutive set bits or ones**.

Now the problem is, You are given an **Array of integers and queries**. Each query is **defined by two integers , . You have to output the count of special bit numbers in the range to .**

Input

Contains integer , no of Array elements and - Total Number of Queries.

Next line contains integers defining Array elements.

Next lines contains Queries of the type

Output

Output lines containing answer for the l'th Query.

Constraints

$0 \leq \text{elements} \leq 10^9$

$0 \leq \text{Input size}(N) \leq 10^9$

$0 \leq \text{Queries} \leq 10^9$

SAMPLE INPUT

```
5 3
3 5 1 12 7
1 3
2 3
1 5
```

SAMPLE OUTPUT

```
1
0
3
```

Explanation

In Query 1 range is [1,3] and there is only one number with consecutive set bits is 3; So ans is 1.

In Query range is [2,3] and there is no number is there with consecutive set bits. So ans is 0.

In Query range is [1,5] and there are 3 numbers with consecutive bits set i.e , and 3.