

GCD, Sum, Multiply. What?...

Input file: **standard input**
Output file: **standard output**
Time limit: 3 seconds
Memory limit: 256 megabytes

The author has used up all the creative skills on previous problems, so Anton won't be tortured in this statement. He will just give you an interesting problem.

You are given an array a consisting of n integers. You are also given q queries $[l; r]$. For each query, find the maximum value of $\text{sum}[tl; tr] \times \text{gcd}[tl; tr]$ over all pairs $(tl; tr)$, where

- $l \leq tl \leq tr \leq r$;
- $\text{sum}[tl; tr]$ — the sum of all numbers in the segment $[tl; tr]$;
- $\text{gcd}[tl; tr]$ — the greatest common divisor of all numbers in the segment $[tl; tr]$.

The greatest common divisor of two numbers a and b is the largest positive integer x that divides both a and b .

The greatest common divisor of a set of numbers is the largest positive integer x that divides all elements of the set.

Input

The first line contains two integers n, q ($1 \leq n, q \leq 2 \cdot 10^5$) — the number of elements in the array and the number of queries, respectively.

The second line contains n integers a_i ($1 \leq a_i \leq 6 \cdot 10^6$) — the description of the array.

Each of the next q lines contains two integers l, r ($1 \leq l \leq r \leq n$) — the description of the queries.

Output

Print q integers — the answers to the queries.

Scoring

1. (4 points): $n \leq 3$;
2. (8 points): $n, q \leq 10^3$;
3. (5 points): $n \leq 10^3$;
4. (17 points): $n, q \leq 10^5$;
5. (14 points): $n \leq 10^5$;
6. (5 points): $a_i \leq 20$;
7. (7 points): $a_i \leq 10^3$;
8. (16 points): $l = 1$;
9. (24 points): no additional constraints.

Examples

standard input	standard output
3 2 3 3 2 1 3 2 3	18 9
8 6 2 4 8 8 8 2 4 16 1 8 2 5 3 4 2 4 7 7 3 6	256 192 128 128 16 192

Note

In the first example, there are following segments:

- $[1; 1] - \text{sum}[1; 1] \times \text{gcd}[1; 1] = 3 \times 3 = 9;$
- $[1; 2] - \text{sum}[1; 2] \times \text{gcd}[1; 2] = 6 \times 3 = 18;$
- $[1; 3] - \text{sum}[1; 3] \times \text{gcd}[1; 3] = 8 \times 1 = 8;$
- $[2; 2] - \text{sum}[2; 2] \times \text{gcd}[2; 2] = 3 \times 3 = 9;$
- $[2; 3] - \text{sum}[2; 3] \times \text{gcd}[2; 3] = 5 \times 1 = 5;$
- $[3; 3] - \text{sum}[3; 3] \times \text{gcd}[3; 3] = 2 \times 2 = 4.$