

Problem M: Max Sum of GCD

- Time Limit: 2 sec

Problem Statement

For a sequence of positive integers $X = (X_1, X_2, \dots, X_M)$ where $M \geq 2$, let $f(X)$ be the answer to the following problem:

- Among the M positive integers X_1, X_2, \dots, X_M , paint at least one and at most $M - 1$ of them red, and paint the rest blue. Let R be the greatest common divisor (GCD) of the integers painted red, and B be the GCD of the integers painted blue. Find the maximum possible value of $R + B$.

You are given a sequence of N positive integers $A = (A_1, A_2, \dots, A_N)$. You will also be given Q queries. For each query, you will be given two integers l_i and r_i such that $1 \leq l_i < r_i \leq N$. For each query, let $X = (A_{l_i}, A_{l_i+1}, \dots, A_{r_i})$, and find $f(X)$.

Input

The input is given in the following format:

```
 $N$   
 $A_1 A_2 \dots A_N$   
 $Q$   
 $l_1 r_1$   
 $l_2 r_2$   
 $\vdots$   
 $l_Q r_Q$ 
```

- $2 \leq N \leq 200,000$
- $1 \leq A_i \leq 10^{18}$ for all $1 \leq i \leq N$
- $1 \leq Q \leq 200,000$
- $1 \leq l_i < r_i \leq N$ for all $1 \leq i \leq Q$

Output

Print Q lines. On the i -th line ($1 \leq i \leq Q$), output the answer to the i -th query.

Sample Input	Sample Output
6 3 6 2 5 4 4 3 1 3 4 6 1 6	7 9 7