# Greatest common divisor

- You are given an array $a_1, a_2, ..., a_n$ consisting of $n$ integers and $q$ queries $g_1, ..., g_q$ on it. For each query $g_i$ you have to count the number of pairs $(l, r)$ such that $1 \le l \le r \le n$ and $gcd(a_l, a_{l+1}, ..., a_r) = g_i$.
- With gcd($v_1, v_2, ..., v_n$) is a greatest common divisor of $v_1, v_2, ..., v_n$, that is equal to a largest positive integer that divides all $v_i$.

You are given a string S that is guaranteed to be a beautiful binary string. Let $N$ be the length of $S$. Consider the lexicographically sorted list of all beautiful binary strings of length $N$. Compute and return the string that comes immediately after $S$ in this list. If $S$ happens to be the last string in the list, return an empty string instead.

# Input

The first line of the input contains integer $n$, ($1 \le n \le 10^5$). The next line contains n space separated integers $a_1, ..., a_n$, ($1 \le a_i \le 10^9$).

The third line of the input contains integer $q$, ($1 \le q \le 3 \times 10^5$), denoting the number of queries. Then follows $q$ lines, each contain an integer $g_i$, ($1 \le g_i \le 10^9$).

# Output

For each query print the result in a separate line.

# Examples

| Standard Input | Standard Output |
|---|---|
| 4<br>2 4 6 3<br>5<br>1<br>2<br>3<br>4<br>6 | 2<br>4<br>2<br>1<br>1 |
| 6<br>10 20 3 15 60 16<br>6<br>1<br>2<br>3<br>4<br>5<br>15 | 10<br>0<br>3<br>1<br>0<br>2 |