Co-prime

2024/2025 SEASON – ROUND 2

In Bulgarian, "co-prime" reads out loud like the slang "How's it goin'?"

You are given N integers $a_1, a_2 \dots a_N$. You should answer Q queries in the form „$l_i\ r_i$" which seek the following: What is the number of ordered co-prime pairs of integers (a, b) modulo $10^9 + 7$, whose sum is equal to $\prod_{j=l_i}^{r_i} a_j$?

Input

First line of the file **coprime.in** reads 2 integers N and Q. The next line consists of N integers: $a_1, a_2 \dots a_N$. Q queries follow, with 2 integers each: $l_i\ r_i$.

Output

Print Q lines in the file **coprime.out** with 1 number on each – the desired count of pairs.

Constraints

$N = 2 * 10^5$, *except the first test where N = 1000*

$1 \leq l_i < r_i \leq N$

$Q = 10^5$, *except the first test where Q = 1000*

$1 \leq a_i \leq 10^6$

Time limit: 1.0 sec.

Memory limit: 256 MB

Sample tests

Input (coprime.in)	Output (coprime.out)
6 3 2 7 3 5 4 3 1 3 1 6 3 5	12 576 16
10 3 205 3485 9490 30438 437539 102 2 14373 134353 34532 1 10 2 6 3 7	658381034 377399215 679633769

Sample test 1 explanation:

The ordered pairs from the first query from the first test: (41, 1), (37, 5), (31, 11), (29, 13), (25, 17), (23, 19), (19, 23), (17, 25), (13, 29), (11, 31), (5, 37), (1, 41).