F. Maximum modulo equality

time limit per test: 5 seconds
memory limit per test: 256 megabytes

You are given an array a of length n and q queries l, r.

For each query, find the maximum possible m, such that all elements a_l, a_{l+1}, ..., a_r are equal modulo m. In other words, $a_l \bmod m = a_{l+1} \bmod m = \cdots = a_r \bmod m$, where $a \bmod b$ — is the remainder of division a by b. In particular, when m can be infinite, print 0.

Input

The first line contains a single integer t ($1 \le t \le 10^4$) — the number of test cases.

The first line of each test case contains two integers n, q ($1 \le n, q \le 2 \cdot 10^5$) — the length of the array and the number of queries.

The second line of each test case contains n integers a_i ($1 \le a_i \le 10^9$) — the elements of the array.

In the following q lines of each test case, two integers l, r are provided ($1 \le l \le r \le n$) — the range of the query.

It is guaranteed that the sum of n across all test cases does not exceed $2 \cdot 10^5$, and the sum of q does not exceed $2 \cdot 10^5$.

Output

For each query, output the maximum value m described in the statement.

Example

input Copy

```
3
5 5
5 14 2 6 3
4 5
1 4
2 4
3 5
1 1
1 1
7
1 1
3 2
1 7 8
2 3
1 2
```

output Copy

```
3 1 4 1 0
0
1 6
```

Note

In the first query of the first sample, $6 \bmod 3 = 3 \bmod 3 = 0$. It can be shown that for greater m, the required condition will not be fulfilled.

In the third query of the first sample, $14 \bmod 4 = 2 \bmod 4 = 6 \bmod 4 = 2$. It can be shown that for greater m, the required condition will not be fulfilled.

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Practice

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Clone Contest

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Language: GNU G++20 13.2 (64 bit, win

Choose file: Choose File No file chosen

Submit

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Submission	Time	Verdict
295467825	Dec/08/2024 01:00	Accepted

→ Problem tags

data structures math number theory

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→ Contest materials

- Announcement
- Tutorial #1
- Video Tutorial (en)