

Dogs and Bones

If one dog eats one bone in one day, how many dogs will eat how many bones in how many days?

Task

This philosophical question keeps Michal awake at night. For the last n days, he has diligently recorded how many dogs ate how many bones. However, he has not yet decided how many days he is actually interested in. He wants to know, for many day intervals, how many dogs ate how many bones during them. Help him!

Input

The first line contains a number $1 \leq n \leq 10^5$ - the number of days Michal has been recording. The second line contains n positive integers a_i - how many dogs ate how many bones on day i . Their sum does not exceed $2 * 10^9$. The third line contains a number $1 \leq q \leq 10^5$ - the number of Michal's questions. Followed by q lines, each containing two numbers $1 \leq l \leq r \leq n$ - the first and last day of the interval that interests Michal.

Output

For each of Michal's questions, print how many dogs ate how many bones from day l to day r , inclusive. In other words, print $a_l + a_{l+1} + \dots + a_{r-1} + a_r$.

Example

input

```
4
5 1 4 2
3
1 4
2 3
4 4
```

output

```
12
5
2
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