

Contest Duration: 2025-12-27(Sat) 23:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20251227T2100&p1=248>) - 2025-12-28(Sun) 00:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20251227T2240&p1=248>) (local time) (100 minutes)

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## E - Heavy Buckets

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Time Limit: 3 sec / Memory Limit: 1024 MiB

Score : 475 points

### Problem Statement

There are  $N$  people and  $N$  buckets. Both the people and buckets are numbered  $1, 2, \dots, N$ .

Initially, person  $i$  holds only bucket  $i$ , and bucket  $i$  is empty.

From now on, the following operation will be performed  $10^9$  times:

- For  $i = 1, 2, \dots, N$  **simultaneously**, person  $i$  adds  $i$  units of water to each of the buckets they are holding and passes those buckets to person  $A_i$ .

Here, there is no limit on the amount of water that can be put in a bucket.

For  $i = 1, 2, \dots, Q$ , answer the following queries:

- Find the amount of water in bucket  $B_i$  immediately after the  $T_i$ -th operation.

### Constraints

- $2 \leq N \leq 2 \times 10^5$
- $1 \leq Q \leq 2 \times 10^5$
- $1 \leq A_i \leq N$
- $1 \leq T_i \leq 10^9$
- $1 \leq B_i \leq N$
- All input values are integers.

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## Input

The input is given from Standard Input in the following format:

```
 $N$   $Q$   
 $A_1$   $A_2$  ...  $A_N$   
 $T_1$   $B_1$   
 $T_2$   $B_2$   
 $\vdots$   
 $T_Q$   $B_Q$ 
```

## Output

Output  $Q$  lines. The  $i$ -th line should contain the answer to the  $i$ -th query.

### Sample Input 1

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```
5 6  
3 4 2 2 5  
4 3  
6 5  
1 4  
10 1  
10 2  
1000000000 1
```

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### Sample Output 1

[Copy](#)

```
11  
30  
4  
28  
30  
2999999998
```

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We will explain the first query.

Initially, bucket 3 is held by person 3.

Immediately after the 1-st operation, bucket 3 is held by person 2 and contains 3 units of water.

Immediately after the 2-nd operation, bucket 3 is held by person 4 and contains 25 units of water.

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Immediately after the 3-rd operation, bucket 3 is held by person 2 and contains 9 units of water.

Immediately after the 4-th operation, bucket 3 is held by person 4 and contains 11 units of water.

Thus, the answer to the first query is 11.

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