Problem C. Misuki and pinecones

Time limit 1000 ms
Memory limit 256MB

Problem Description

Is this Misuki?

Misuki is a citizen of Gensokyo, which can be represented as a directed graph with N nodes. The i-th node has A_i pinecones.

For every $1 \leq i \leq N$, please answer the maximum of pinecones Misuki can collect if she starts from node i, moves arbitrarily within Gensokyo, and then returns to node i.

She can pass through any node and edge multiple times, but once the pinecones from a node are collected, they won't grow back.

Input format

The first line contains two integers N ($1 \leq N \leq 2 \times 10^5$) and M ($1 \leq M \leq 2 \times 10^5$).

The second line contains N integers $A_1, A_2, \ldots, A_N$ ($1 \leq A_i \leq 10^9$).

The next M lines each contain two integers, a and b, representing a directed edge from a to b ($1 \leq a, b \leq n$).

Output format

Output N integers. The i-th integer means the maximum of pinecones Misuki can collect if she starts from node i.

Subtask score

Subtask	Score	Additional Constraints
1	29	$N \leq 5000$.
2	71	No constraints

Sample

Sample Input 1

```
5 7
1 2 3 4 5
1 3
2 4
3 5
1 4
4 2
5 2
5 1
```

Sample Output 1

```
9 6 9 6 9
```