Problem C. Coin

Time limit 1000 ms
Memory limit 256MB

Problem Description

The game consists of n rooms connected by m tunnels, with each room containing a certain number of coins. For each starting room, determine the maximum number of coins you can collect by traveling through the tunnels and ending in any room of your choice.

Input format

The first input line has two integers n ($1 \leq n \leq 2 \cdot 10^5$) and m ($1 \leq m \leq 2 \cdot 10^5$): the number of rooms and tunnels. The rooms are numbered $1, 2, \ldots, n$.

Then, there are n integers $k_1, k_2, \ldots, k_n$ ($0 \leq k_i \leq 10^9$): the number of coins in each room.

Finally, there are m lines describing the tunnels. Each line has two integers a ($1 \leq a \leq n$) and b ($1 \leq b \leq n$): there is a tunnel from room a to room b. Each tunnel is a one-way tunnel.

Output format

Print n integers: the i-th integer should represent the maximum number of coins that can be collected starting from room i.

Subtask score

Subtask	Score	Additional Constraints
1	30	No room can be re-entered once you leave it.
2	20	$n \leq 5 \cdot 10^3$
3	50	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

```
15 6 15 6 15
```

Notes