Magic boy Bi Luo with his excited tree

Time Limit: 8000/4000 MS (Java/Others) Memory Limit: 131072/131072 K (Java/Others)
Total Submission(s): 617 Accepted Submission(s): 150

Problem Description

Bi Luo is a magic boy, he also has a migic tree, the tree has N nodes , in each node , there is a treasure, it's value is $V[i]$, and for each edge, there is a cost $C[i]$, which means every time you pass the edge i, you need to pay $C[i]$.

You may attention that every $V[i]$ can be taken only once, but for some $C[i]$, you may cost severial times.

Now, Bi Luo define $ans[i]$ as the most value can Bi Luo gets if Bi Luo starts at node i

Bi Luo is also an excited boy, now he wants to know every $ans[i]$, can you help him?

Input

First line is a positive integer $T(T \leq 10^4)$, represents there are T test cases.

Four each test：

The first line contain an integer $N(N \leq 10^5)$

The next line contains N integers $V[i]$, which means the treasure's value of node $i(1 \leq V[i] \leq 10^4)$

For the next $N-1$ lines, each contains three integers u, v, c , which means node u and node v are connected by an edge, it's cost is $c(1 \leq c \leq 10^4)$

You can assume that the sum of N will not exceed 10^6

Output

For the i-th test case , first output Case #i: in a single line , then output N lines , for the i-th line , output $ans[i]$ in a single line.

Sample Input

```
1
5
```

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

Sample Output

```
Case #1:
15
10
14
9
15
```

Author

UESTC

Source

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