Mynerva

Time limit: 4.0s   **Memory limit:** 256M

In Mynerva, there are N floating islands connected by M bidirectional rainbow bridges. Each bridge has a different brightness and the length of each bridge is 1. There are Q animals that are trying to travel from island 1 to another island. These animals can either be white or black. The animals all want to get to their destination while travelling the shortest distance. If there are many paths of the same distance, the white animals will try to maximize the total brightness of the bridges they cross, while the black animals will try to minimize it. Calculate the distance each animal will travel and the total brightness they will encounter on their journey.

Input

The first line contains N and M.

The next M lines are in the form x y z representing a path between x and y with a brightness z.

The next line contains Q.

The next Q lines contain d_i, the destination of the ith animal, followed by either `White` or `Black`, representing their color.

Constraints

$1 \leq x, y, d_i \leq N \leq 5 \times 10^5$
$1 \leq z \leq 256$
$N - 1 \leq M \leq 10^6$
$1 \leq Q \leq 10^5$

Output

For each of the Q animals, output the length and brightness of their best path.

Note: it will always be possible for each animal to reach their destination.

Sample Input

```
5 7
4 1 7
5 2 1
5 3 9
5 4 5
1 5 1
3 1 8
3 4 6
5
2 Black
5 Black
3 Black
3 White
1 White
```

Sample Output

```
2 2
1 1
1 8
1 8
0 0
```