Beef

Time Limit	Memory Limit
1 second	128 MB

Statement

Your new company, *Intercontinental Beef Makers* (ICBM) has just opened. With the promise "from us to you in 25 minutes, or the next one's free", your business specialises in delivering beef from your supply point to any other part of the world in the shortest time possible. Your couriers, using the latest *Astro-Navigational GUidance System* (ANGUS) technology, deliver along the shortest path to a target location.

Clearly, the world is modelled as a connected graph with N cities and M bidirectional guidance lines, with the ith line taking t_i microseconds to travel. Your supply location is located at city 1, and today you wish to deliver to city N by travelling along the guidance lines.

Each city has an *air quality* rating (perhaps factoring things like waterfalls, pollution and an absence of surface to air missile systems), given as an positive integer. Air quality affects the taste of beef, and it so happens that the resulting quality of beef upon delivery is equal to the median of the air qualities among all cities passed along the journey (including nodes 1 and N). Luckily for our calculations, no matter how we travel, even if taking guidance lines more than once, we must travel through an even number of them to pass from city 1 to city N.

Due to your promise, you must deliver to your client in the shortest amount of time possible, and you must also maximise the quality of beef **subject to this constraint**. Your task is to find the shortest time, and across all paths with the minimum time, determine the maximum quality of beef.

Input

The first line contains 2 integers N M. The next line contains N integers a_1 ... a_N, where a_i is the air quality of the ith city. M lines follow, the ith line contains 3 integers u_i v_i t_i, describing a guidance line between cities u_i and v_i taking t_i microseconds to travel.

Output

Output two space-separated integers, the time needed to deliver the beef and the maximum quality of beef.

Sample Input 1

```
3 2
3 1 4
1 2 15
2 3 92
```

Sample Output 1

```
107 3
```

Sample Input 2

```
8 10
1 1 1 1 2 2 2 2
1 2 1
1 3 1
2 4 1
4 3 1
4 5 1
4 7 1
8 5 1
8 7 1
6 2 1
6 7 1
```

Sample Output 2

```
4 2
```

Sample Input 3

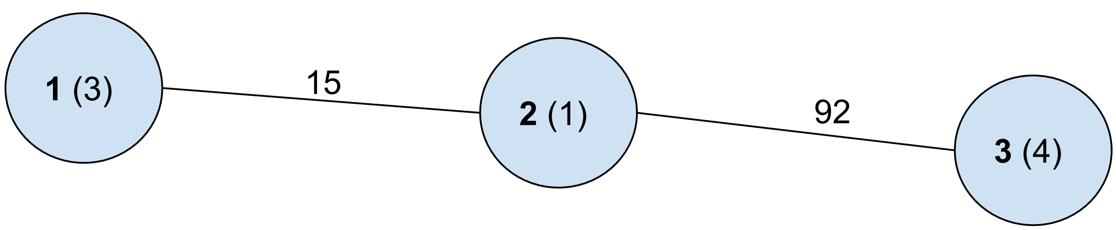
```
7 8
1 2 3 4 5 6 7
1 2 1
1 4 3
3 2 1
3 4 1
3 6 100
5 4 1
5 6 1
6 7 6
```

Sample Output 3

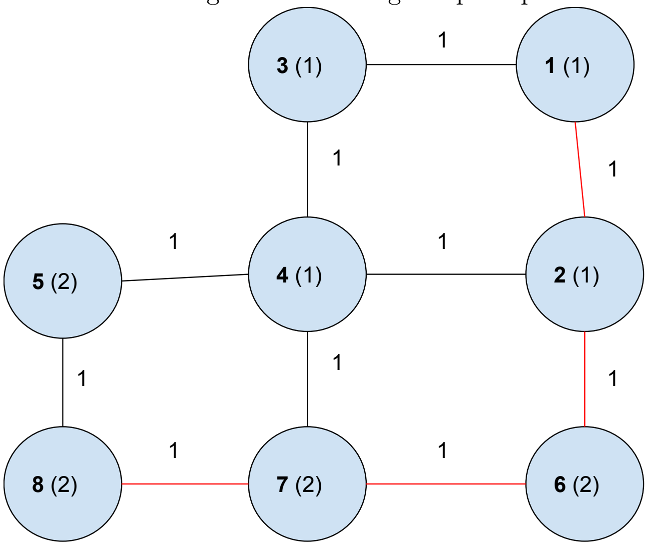
```
11 5
```

Explanation

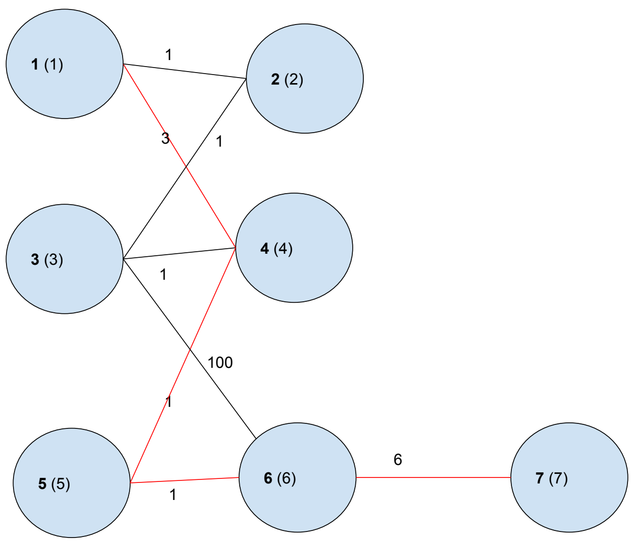
Below is a diagram illustrating sample input 1. It is clear that the only path has median quality 3 and time $15 + 92 = 107$. The label of each city is in bold, whereas the corresponding air quality is in brackets. Each guidance line is labelled with its travel time.



Below is a diagram illustrating sample input 2. The optimal path is in red, with median 2.



Below is a diagram illustrating sample input 3. The optimal path is in red, with median 5. Note that the path $1 \to 2 \to 3 \to 4 \to 5 \to 6 \to 7$ has median 4, so is inferior to the red path.



Constraints

- $3 \le N \le 10^5$
- $N - 1 \le M \le 2 \times 10^5$
- $1 \le a_i \le 10^9$ for all i
- $1 \le u_i, v_i \le N$ for all i
- $1 \le t_i \le 10^4$ for all i
- It is possible to travel between any 2 cities via guidance lines.
- City N cannot be reached from city 1 using an odd number of guidance lines.

Subtasks

Number	Points	Other constraints
1	28	$a_i = 1$ for all i
2	8	$M = N - 1$
3	20	$a_i \le 5$ for all i
4	32	$t_i = 1$ for all i and $N \le 200$
5	12	No further constraints

Note that:

- Sample input 1 conforms to the requirements of subtasks 2 and 3.
- Sample input 2 conforms to the requirements of subtasks 3 and 4.