

Problem 1002. Link with Running

Link hates running.

Today, Link is asked to run. Roads in BIT can be described as n nodes and m **directed** edges. Link has to run from node 1 to node n . When Link is at node u_i , he can run through the i -th edge to get to node v_i . Every time he runs through the i -th edge, he spends e_i points of energy and gains p_i points of physical fitness.

As a lazy boy, Link wants to spend as little energy as possible. He is also greedy and wants to gain maximum physical fitness when spending minimum energy.

Tell Link the minimum energy min_e he needs to spend and the maximum physical fitness max_p he can gain when spending the minimum energy.

Input

Each test contains multiple test cases. The first line contains the number of test cases T ($1 \leq T \leq 12$). Description of the test cases follows.

The first line contains two integers n, m ($2 \leq n \leq 10^5, 1 \leq m \leq 3 \times 10^5$), which are the number of nodes and the number of edges.

Each of the next m lines contains four integers u_i, v_i, e_i, p_i ($1 \leq u_i, v_i \leq n, 0 \leq e_i, p_i \leq 10^9$), describing an edge.

Output

For each test case, output min_e and max_p in a single line, separated by one space.

IT IS GUARANTEED THAT THE ANSWER EXISTS!!!

Example Input

```
2
3 3
1 2 1 1
2 3 1 1
1 3 2 0
3 3
1 2 1 1
2 3 1 1
1 3 1 0
```

Example Output

```
2 2
1 0
```