Problem A. Minimum Product

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

Little A has a directed graph containing N points and M edges. For the i-th edge (u_i, v_i), there are two attributes (a_i, b_i).

A path P is defined as a directed path from point 1 to point N, with its path weight given by:

$$\left(\sum_{i \in P} a_i\right) \times \left(\sum_{i \in P} b_i\right)$$

Little A is very eager to know what the minimum weight is among all possible paths from node 1 to node N. Please help him calculate this minimum product weight.

Input

The first line contains a positive integer T ($1 \le T \le 10^3$), indicating the number of test cases.

For each test case, the first line contains two integers N, M ($1 \le N \le 300, 1 \le M \le 10^3$), representing the number of points and edges in the graph, respectively.

The following M lines each contain four integers u_i, v_i, a_i, b_i ($1 \le u_i, v_i \le N, u_i \ne v_i, 1 \le a_i, b_i \le 200$), representing the starting point, ending point, and weight attributes of a directed edge in the graph.

It is guaranteed that there exists at least one path from node 1 to node N.

It is guaranteed that the sum of N in each test case does not exceed 10^3, and the sum of M does not exceed 2×10^3.

Output

For each test case, output the values of $\sum_{i \in P} a_i$ and $\sum_{i \in P} b_i$ corresponding to the path with the minimum weight.

If there are multiple paths with the same minimum weight, please output the values corresponding to the path with the smallest $\sum_{i \in P} a_i$.

Example

standard input	standard output
1 5 9 3 4 3 5 4 5 5 1 1 4 2 2 3 4 5 2 1 4 2 4 2 1 3 2 4 2 5 4 4 1 2 2 4 1 3 1	7 3