Problem D
Working Holiday

Input File: *testdata.in*
Time Limit: 5 seconds

Problem Description

A working holiday visa is a residence permit which allows travelers to undertake employment in the country issuing the visa for the purpose of supplementing their travel funds. Your friend John plans to apply such visa to visit the Kingdom of Peateq and to earn as much money as he can. The citizens of the Kingdom of Peateq love to drink peach tequila cocktail (PTC). Every city in the Kingdom of Peateq has at least one PTC factory, and every PTC factory in the Kingdom has a unique PTC recipe. However, PTC is hard to preserve. Any bottle of PTC loses its flavor completely in 15 days after being bottled. The people in the Kingdom of Peateq have strong demands on all kinds of PTC from the other cities, since their flavor are considerably rare.

The easiest way to earn money in the Kingdom of Peateq is to help the PTC manufacturers to distribute their product to the other cities. Currently, John's plan is to rent a truck to transport PTC. John can earn x dollars if he carries x bottles of PTC from the factory to any city other than the location of the factory. He notes that every factory only hires people to carry its PTC to the city where its PTC has the highest price, because this strategy will achieve the maximum profit. Suppose there are n cities $c_1, \ldots, c_n$ and m factories $f_1, \ldots, f_m$ in the Kingdom of Peateq. John finds out that factory f_i is located in city c_{s_i} and it only ships PTC to c_{t_i}. Moreover, his truck can carry at most w_i bottles of PTC manufactured by factory f_i in d_i days from city c_{s_i} to city c_{t_i}.

However, John has some problems:

- He must return the truck to the city where he rents it.

- The fuel is quite expensive, so John cannot travel from one city to another without carrying PTC for some factory. Otherwise, no one will pay the fuel for John.

He need your help to find out the most efficient way to make money in the Kingdom of Peateq. Please help John to calculate the maximum average amount of money earned by transporting PTC per day. Then, John can determine where to rent his truck.

Technical Specifications

1. The number of test cases would be smaller than or equal to 20.
2. You may assume that $1 \leq n \leq 100$ and $1 \leq m \leq 200$.
3. s_i, t_i, w_i and d_i are integers such that $1 \leq s_i \leq n$, $1 \leq t_i \leq n$, $s_i \neq t_i$, $1 \leq w_i \leq 1000$, and $0 < d_i < 15$ for every $1 \leq i \leq m$.
4. There is always a city such that John can rent and return his truck there, since every city has at least one PTC factory.

Input Format

The first line of the input file contains an integer indicating the number of test cases to follow. The first line of each test case contains two integers n and m. n is the number of cities in the Kingdom of Peateq, and m is the number of PTC factories. The $(1+i)$-th line of each test case contains four integers s_i, t_i, w_i and d_i. Note that factory f_i is located in city c_{s_i} and it only ships PTC to c_{t_i}. Moreover, John's truck can carry at most w_i bottles of PTC manufactured by factory f_i in d_i days from city c_{s_i} to city c_{t_i}.

Output Format

For each test case, output the maximum average amount of money earned by transporting PTC per day in the form of reduced fraction. The numerator and the denominator should be positive and separated by a slash '/'.

Sample Input

```
3
3 3
1 2 3 1
2 3 1 1
3 1 2 1
4 6
1 2 3 1
2 3 1 3
3 1 2 3
4 2 1 3
1 4 2 2
3 4 2 1
3 3
1 2 30 10
2 3 10 10
3 1 20 10
```

Sample Output

```
2/1
6/7
2/1
```