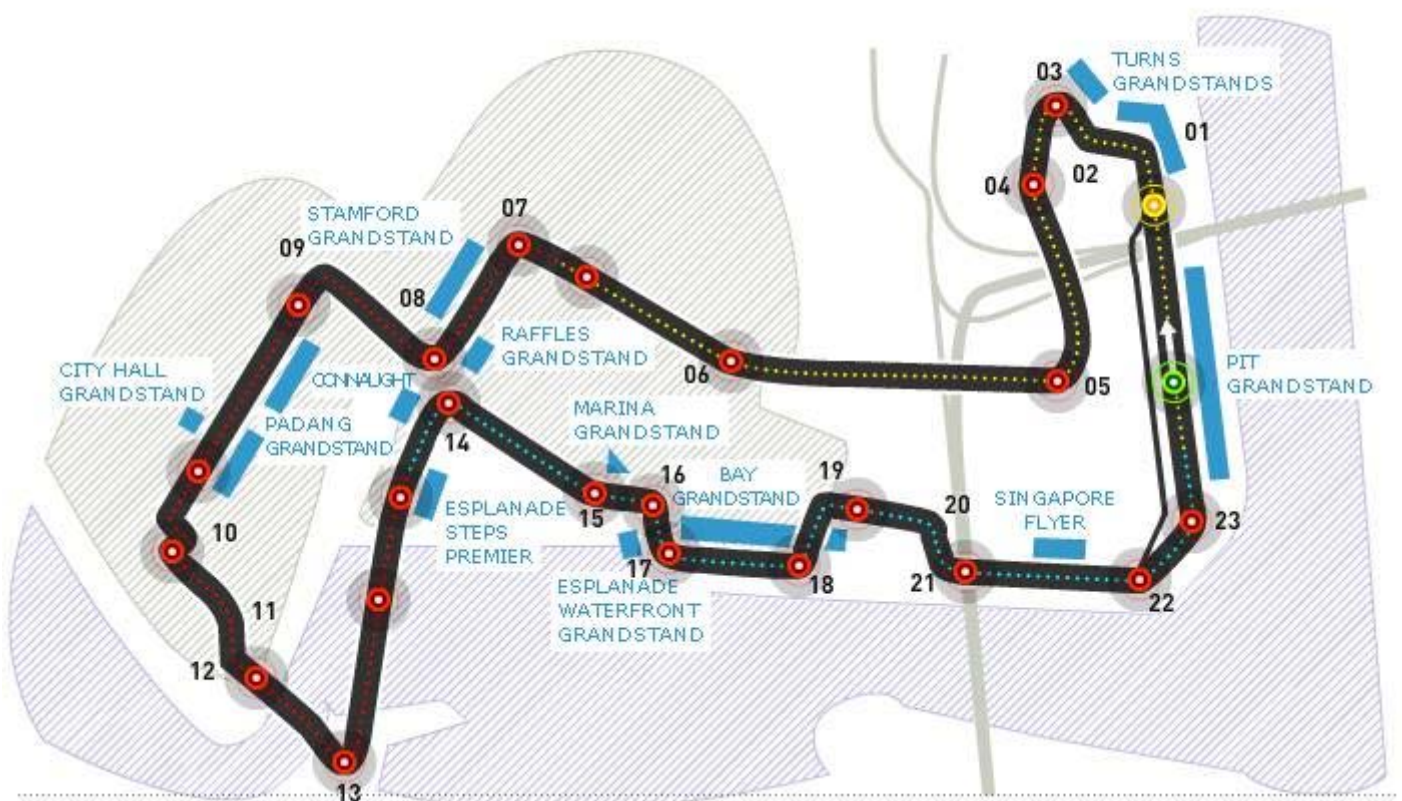


Building Singapore Grand Prix Circuit

FORMULA 1 has come to Singapore! A brand new street circuit will be built around Marina Bay. Now you (Halim Tilke), the most famous circuit designer, are invited to design the new circuit.

The circuit should start at the Main (Pit) Grandstand, and end at the same place to form a circuit. Since it is a street circuit, you only need to select some streets in the city to form the circuit. Of course, the new circuit you are going to design will be the most wonderful and challenging circuit in the world. You mark each street with a "difficulty" to measure its challenge level. The overall difficulty of a circuit is the sum of the difficulty of all selected streets. You realize that maximizing the overall difficulty will lead to a circuit that is too long. Instead, you decide to maximize the "average difficulty", which is the circuit overall difficulty divided by its total length. You believe that a circuit with higher average difficulty will be more exciting.



You can assume that the city map is made of some intersection points and some streets. Each street is one-way, connecting two intersection points, with given difficulty and length. Your circuit must pass the Main Grandstand, which is also an intersection point. Moreover, it is guaranteed that **all possible circuits will pass the Main Grandstand (i.e. all cycles in the given graph will pass the intersection representing the Main Grandstand)**.

Input

In the first line you are given an integer TC ($1 \leq TC \leq 10$), denoting the number of test cases that follow.

In the first line of each test case, two integers N and M are given, denoting the number of intersections and streets respectively.

Then M lines follow. Each line contains four integers X, Y, D and L, denoting the starting intersection, ending intersection, difficulty and the length of the street.

Intersection points are numbered from 0 to N-1. The Main Grandstand is intersection No. 0.

It is guaranteed that there is at least one circuit can be built (at least one cycle in the given graph).

Constraints: $1 \leq N \leq 10000$; $1 \leq M \leq 500000$; $0 \leq X, Y \leq N-1$, $1 \leq D \leq 100000$, $1 \leq L \leq 100000$.

Time limit: 20s.

Note that the input size is large! Please use scanf() instead of input stream!

Output

For each test case, output one float number, denoting the average difficulty of the best possible circuit. The float should be rounded to the third place after the decimal point.

Sample Input	Output for Sample Input
<pre>1 4 6 0 1 20 20 1 2 100 20 1 3 110 10 1 3 150 20 2 3 100 20 3 0 20 20</pre>	3.167

Explanation

Street 0 (0->1) -> Street 3 (1 ->3) -> Street 5 (3->0)

Overall difficulty: 190; Total length: 60; Average difficulty: 3.167

Other two possible circuits:

Street 0 (0->1) -> Street 1 (1->2) -> Street 4 (2->3) -> Street 5 (3->0)

Overall difficulty: 240; Total length: 80; Average difficulty: 3.000

Street 0 (0->1) -> Street 2 (1->3) -> Street 5 (3->0)

Overall difficulty: 150; Total length: 50; Average difficulty: 3.000

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