Attraction Score

Input file:	`standard input`
Output file:	`standard output`
Time limit:	6 seconds
Memory limit:	1024 megabytes

There are n cities, numbered from 1 to n, in the fictional country of Manteiv. We can consider these cities to be on a flat plane with a 2D coordinate system, where city i is at coordinates (x_i, y_i). No two cities are located at the same position.

There are m highways, numbered from 1 to m, each of which is a line segment with two different cities as its endpoints and has a number of attraction points alongside it. Specifically, highway j has a_j attraction points and connects cities u_j and v_j as its endpoints. Having intersections on highways causes traffic jams, and building a highway on top of another highway costs a lot of money. Therefore, it is guaranteed that

- no two highways intersect at any point other than at a city,
- no highway passes through a city other than its two endpoints, and
- there is at most one highway connecting each pair of cities.

The Manteiv Ministry of Tourism would like to choose a subset of cities as tourist attractions. Intuitively, the ministry would like many pairs of chosen cities to be connected by a highway with many attraction points. Formally, the *attraction score* of a non-empty subset of cities S is defined as follows:

- For every pair of integers (a, b) where $a < b$, cities a and b are in S, and they are connected by a highway, add the number of attraction points on the highway to the score.
- Let $f(S)$ be the number of pairs of integers (a, b) where $a < b$, cities a and b are in S, and they are **not** connected by a highway. The score incurs a penalty (negative) score of 10^6 multiplied by **the square of** $f(S)$. In other words, subtract $10^6 \times f(S)^2$ from the score.

For example, let $n = 3$, cities 1 and 2 be connected by a highway with 10 attraction points, cities 2 and 3 be connected by a highway with 20 attraction points, and cities 1 and 3 not be connected by a highway.

- The attraction score of the subset of cities $\{1\}$ is 0.
- The attraction score of the subset of cities $\{1, 2\}$ is $10 - 10^6 \times 0^2 = 10$.
- The attraction score of the subset of cities $\{2, 3\}$ is $20 - 10^6 \times 0^2 = 20$.
- The attraction score of the subset of cities $\{1, 2, 3\}$ is $10 + 20 - 10^6 \times 1^2 = -999\,970$.

As an advisor to the ministry, you would like to find the maximum attraction score among all possible non-empty subsets of cities S.

Input

The first line of input contains two integers n and m ($1 \le n \le 100\,000; 0 \le m \le 300\,000$). Each of the next n lines contains two integers. The i-th line contains x_i and y_i ($0 \le x_i, y_i \le 10^9$). Each of the next m lines contains three integers. The j-th line contains u_j, v_j, and a_j ($1 \le u_j < v_j \le n; 0 \le a_j \le 10^6$). The highways are guaranteed to satisfy the conditions in the problem statement.

Output

Output an integer representing the maximum attraction score among all possible non-empty subsets of cities S.

Examples

standard input	standard output
3 2 0 0 0 1 1 0 1 2 10 2 3 20	20
3 3 0 0 0 1 1 0 1 2 10 2 3 20 1 3 30	60

Note

Explanation for the sample input/output #1

This sample is the example given in the problem statement above. The subset of cities $\{2, 3\}$ gives the highest attraction score of 20.

Explanation for the sample input/output #2

The cities and highways are illustrated by Figure 1. By choosing cities 1, 2, and 3 in S, the attraction score would be $10 + 20 + 30 - 10^6 \times 0^2 = 60$.

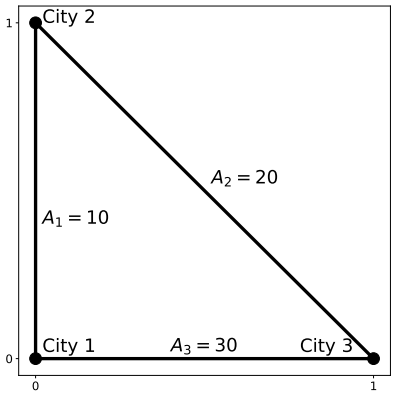

Рис. 1: Illustration of sample input #2.