

Task: NAJ

The Invasion

Bolivian ICPC Camp, contest #4. Source file naj.* Available memory: 128 MB.

And so it has come – the Triangles have invaded Byteotia! Byteotia lies on an island, occupying its entire surface. The shape of the island is a convex polygon (i.e. a polygon whose each inner angle is smaller than 180°). A certain number of software factories are located in Byteotia, each of which generates constant gains or losses.

The Triangles have decided to occupy such a part of Byteotia which:

- is a triangle-shaped area, the vertices of which are three different vertices of the polygon-island,
- brings the largest income i.e. the sum of all gains and losses generated by factories within the occupied area is maximal.

We assume that a factory located on the border or in the vertex of occupied area belongs to that area. A territory which contains no factory brings, obviously, a zero income.

Byteasar, the King of Byteotia, is concerned by the amount of losses the Triangles' invasion could generate. Help him by writing a program which shall calculate the sum of gains and losses generated by factories which the Triangles wish to capture.

Input

The first line of the input contains a single integer n ($3 \leq n \leq 600$), denoting the number of vertices of the polygon-island. The following lines of the input contain two integers each x_j and y_j ($-10\,000 \leq x_j, y_j \leq 10\,000$), separated by a single space, denoting the coordinates x and y of consecutive vertices of the island, in a clockwise order. The next line contains a single integer m ($1 \leq m \leq 10\,000$), denoting the total number of factories. In each of the following lines there are three integers x'_i , y'_i and w_i ($-10\,000 \leq x'_i, y'_i \leq 10\,000$, $-100\,000 \leq w_i \leq 100\,000$), separated by single spaces, denoting: the coordinates x and y of the i -th factory and the gain (for $w_i \geq 0$) or loss (for $w_i < 0$) this factory generates, respectively. Each factory is situated on the polygon-island i.e. within or on the border of it. Distinct factories may be located in the same place i.e. have the same coordinates.

Output

The first and only line of the output should contain a single integer denoting the maximal value of sum of all gains and losses generated by factories within a triangle whose vertices are three different vertices of the polygon-island. Notice that it may happen that the outcome is a negative integer.

Example

For the input data:

```
5
4 1
1 4
8 9
11 5
8 1
4
7 2 3
6 3 -1
4 5 3
9 6 -4
```

the correct result is:

```
5
```

