Problem: Cod Fishing

Cod&Co, the fishing company, have identified a number of cod fishing spots that they are trying to assign to the fishing vessels in their fleet on the North Atlantic. The main goal of the company is to maximise the total amount of cod they fish.

Every fishing spot contains an estimated amount of fish, and every fishing boat has a performance rating. The bigger the rating, the more fish the crew of the boat have captured in the past and the more experienced they are. As a consequence, no crew will accept to be assigned a spot with fewer fish than a spot assigned to a crew with a lesser rating. All spots have a different amount of fish and all ratings are different.

A fishing spot may only be assigned to one boat and no boat may be assigned more than one fishing spot. To fish at the assigned spot, each boat needs first to move from its current location to where its fishing spot is located. Due the Rules of Traffic on the Open Sea, a boat may only travel parallel to the axes of the (2-dimensional) coordinate system, even if that means crossing paths with other boats or passing by a fishing spot assigned to another boat.

Since travelling bigger distances means added fuel costs, and crews' salaries increase with their rating, in order to save costs Cod&Co would like to minimise the total distance travelled by the boats, on their way to their fishing spots, and the total ratings of the boats that are assigned fishing spots.

The final assignment of fishing spots to fishing boats must be one where the greatest possible amount of fish is captured. Of all the assignments satisfying that condition, the one chosen must be one that, first, minimises the total distance travelled by the boats, and, second, minimises the total ratings of the boats involved.

In the example depicted in the picture below, there are two boats, with ratings 120 and 60, and two fishing spots, with amounts of fish 20 and 30, at the coordinates shown.
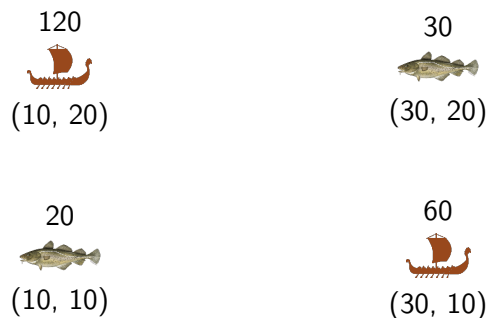
The fishing spots cannot be assigned to the boats closest to them, because the boat with a higher rating would get the spot with fewer fish. In this example, the total amount of fish that can be captured is 50, the total distance travelled will be 40, and the ratings of the boats add up to 180.

Task

Your task is to write a program that, given the locations and ratings of the fishing boats, and the locations of the fishing spots, along with the amount of fish in each of them, computes the total amount of fish that may be captured, the total distance travelled, and the sum of ratings of the boats that have been assigned a spot. The computation should be done in a way that, first, maximises the amount of fish captured, second, minimises the total distance travelled, and, third, minimises the sum of the ratings of the crews.

Input

The first line contains two integers, B and S, separated by a space character, representing, respectively, the number of fishing boats, and the number of cod fishing spots.

The following B lines contain three whitespace-separated integers, that describe the fishing boats. The first two integers stand for the (x, y) coordinates of the boat, and the third represents the rating R of the boat.

The following S lines contain three whitespace-separated integers, that describe the fishing spots. The first two integers stand for the (x, y) coordinates of the fishing spot, and the third represents the amount A of fish in the fishing spot.

Constraints

$1 \le B \le 4\,000$	Number of boats in the fleet
$1 \le S \le 4\,000$	Number of fishing spots
$1 \le x, y \le 10\,000$	Coordinates
$1 \le R \le 10\,000$	Boat rating
$1 \le A \le 10\,000$	Amount of fish in a fishing spot

Output

The output consists of one line with three integers, separated from one another by a space character, where the first denotes the total amount of fish captured, the second denotes the total distance travelled, and the third denotes the sum of the ratings of the boats.

Sample Input 1

```
2 2
10 20 120
30 10 60
10 10 20
30 20 30
```

Sample Output 1

```
50 40 180
```

Sample Input 2

```
3 2
30 10 60
10 20 120
20 20 10
30 20 30
10 10 20
```

Sample Output 2

```
50 30 70
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