Problem A. Super Non-massive Black Hole

Input file:	`standard input`
Output file:	`standard output`
Time limit:	5 seconds
Memory limit:	512 megabytes

You are working on the study of atomic black holes. The study area is a three-dimensional space. In this space there are n integer points in which atomic black holes can arise, we call them observation points. Also, the installation contains m sensors. Sensors are fixed and cannot be moved relative to each other. However, all sensors together can be moved along the vector $(1, 1, 1)$. That is, if initially the i-th sensor has coordinates (u_i, v_i, w_i), after moving i-th sensor will have coordinates $(u_i + d, v_i + d, w_i + d)$, where d is an arbitrary integer that is the same for all sensors.

A sensor located at the point (u, v, w) reacts to a black hole at the point (x, y, z) if $x \le u$, $y \le v$ and $z \le w$, we say that in this case this point is in the visibility range of this sensor. It is necessary that each observation point is in the visibility range of at least one sensor. At the same time, in order to increase the sensitivity of the sensors, they need to be located as close as possible to the observation points. That is, it is required to choose the minimum value of d such that if all sensors are moved by the vector (d, d, d), each observation point will be in the visibility range of at least one sensor.

An arbitrary number of observation points and sensors can be located at the same point.

Input

The first line contains two integers n and m, the number of observation points and the number of sensors, respectively ($1 \le n, m \le 500\,000$).

The next n lines contain the coordinates of the observation points. Each line contains three integers x_i, y_i, and z_i, the coordinates of the i-th observation point ($-10^{18} \le x_i, y_i, z_i \le 10^{18}$).

The next m lines contain the initial coordinates of the sensors. Each line contains three integers u_i, v_i, and w_i, the initial coordinates of the i-th sensor ($-10^{18} \le u_i, v_i, w_i \le 10^{18}$).

Output

Output one integer, the minimum value of d such that if all sensors are moved by the vector (d, d, d), each observation point will be in the visibility range of at least one sensor.

Scoring

Subtask	Score	Constraints	
		n, m	x_i, y_i, z_i, u_i, v_i, w_i
1	11	$1 \le n, m \le 5\,000$	$\lvert x_i\rvert, \lvert y_i\rvert, \lvert z_i\rvert, \lvert u_i\rvert, \lvert v_i\rvert, \lvert w_i\rvert \le 5\,000$
2	21	$1 \le n, m \le 100\,000$	$\lvert x_i\rvert, \lvert y_i\rvert, \lvert z_i\rvert, \lvert u_i\rvert, \lvert v_i\rvert, \lvert w_i\rvert \le 100\,000$
3	20	$1 \le n, m \le 200\,000$	$\lvert x_i\rvert, \lvert y_i\rvert, \lvert z_i\rvert, \lvert u_i\rvert, \lvert v_i\rvert, \lvert w_i\rvert \le 10^9$
4	20	$1 \le n, m \le 300\,000$	$\lvert x_i\rvert, \lvert y_i\rvert, \lvert z_i\rvert, \lvert u_i\rvert, \lvert v_i\rvert, \lvert w_i\rvert \le 10^9$
5	28	$1 \le n, m \le 500\,000$	$\lvert x_i\rvert, \lvert y_i\rvert, \lvert z_i\rvert, \lvert u_i\rvert, \lvert v_i\rvert, \lvert w_i\rvert \le 10^{18}$

Examples

standard input	standard output
3 2 4 5 6 5 6 4 6 4 5 1 2 3 3 2 1	4
1 1 3 2 1 4 5 6	-1

Note

In the first example there are three observation points with coordinates $(4, 5, 6)$, $(5, 6, 4)$, and $(6, 4, 5)$, and two sensors with coordinates $(1, 2, 3)$ and $(3, 2, 1)$. If all the sensors are shifted by the vector $(4, 4, 4)$, then they move to the points $(5, 6, 7)$ and $(7, 6, 5)$, respectively. The first and second observation points are in the visibility range of the first sensor, and the second and third observation points are in the visibility range of the second sensor.