Computer lab

English Vietnamese

The are N teams participating in the next year regional ACM contest in Ho Chi Minh city. The organization board has arranged N computers for the teams. Team i will sit at coordinates x_i, y_i.
To help the teams access the judging system easily, the organization board has also arranged M access points. They want to setup the computer lab so that:

- Each computer is connected to exactly one access point.
- The number of computers connected to the access points are different by no more than one.
- The total "flickering number" of the network is minimized. The flickering number of a computer is measured by the square distance from this computer to the access point that it is connected to.

Input

- First line: two numbers M and N.
- In the next M lines, each line contain two numbers that are coordinates of the access points.
- In the next N lines, each line contain two numbers that are coordinates of the computers.

Output

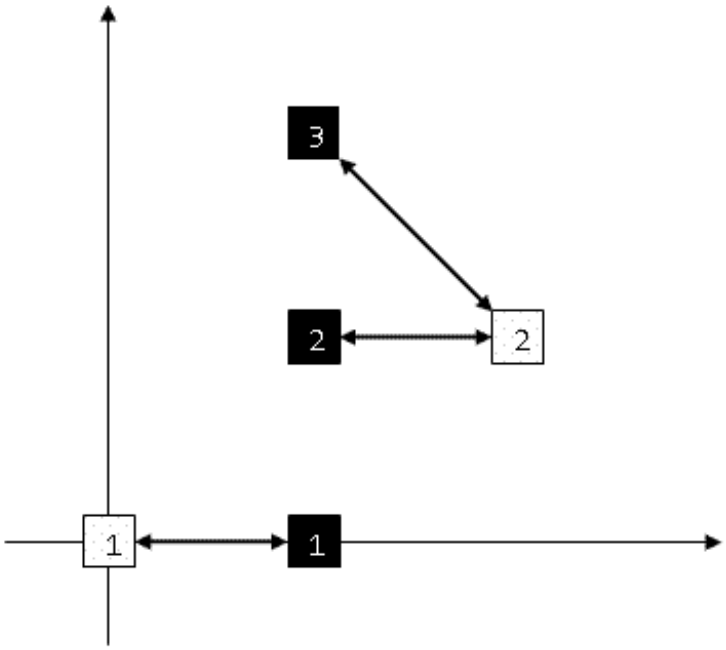
- Line 1: print the minimum total flickering number of the network.
- Line 2: print N numbers. The i^{th} number is the index of the access point that computer i connected to.

Example

Input
2 3
0 0
2 1
1 0
1 1
1 2

Output
4
1 2 2

The following figure represents the example test case. The computer are represented by black squares and the access points are represented by white squares.



Constraints

1 ≤ N ≤ 200, 1 ≤ M ≤ 50. Coordinates are integers having absolute values no more than 1000.