Borderline

The continent of Flatland is a vast **n** by **n** grid of land, boasting a dizzing array of biomes, climates, and cultures. Flatland has seen many wars of conquest and inquest (as well as many side quests) in its long and storied history. Currently, the continent is divided between **k** rival kingdoms, each helpfully labelled by an integer between 1 and **k**. Each kingdom owns a contiguous set of cells in the grid and no cell is left unclaimed.

Each kingdom possesses many cities. A city located within a cell owned by a given kingdom is said to have allegiance to that kingdom.

A traveller from an antique land wants to explore the continent. Unfortunately, they have forgotten their map. Before arriving, the traveller has made a note of the locations and allegiances of **c** cities in Flatland. They are also aware of another **q** cities dotted around the continent. Using the **c** known cities, they want to predict the allegiances of the **q** unknown cities.

The traveller considers a success rate of 85% to be sufficiently serendipitous for the problem to be solved.

INPUT   You will be given four integers, **n**, **k**, **c**, and **q**, denoting the the size of the continent, the number of kingdoms, the number of known cities, and the number of unknown cities, respectively.

This will be followed by **c** lines each containing three integers **x**, **y**, and **s**, denoting the existence of a city at coordinates **x**, **y** with an allegiance to kingdom **s**.

This will be followed by **q** lines each containing two integers **x** and **y**, denoting the existence of a city at coordinates **x**, **y** with an unknown allegiance.

$100 \leq$ **n** ≤ 3000
$3 \leq$ **k** ≤ 30
$10 \cdot$ **k** $\leq$ **c** ≤ 1000
$100 \leq$ **q** ≤ 5000
q $< 10 \cdot$ **c**

OUTPUT   For each city with an unknown allegiance, you should output an integer on a new line, denoting the predicted allegiance of that city. Your output should be in the same order as the input.