1313 – Protect the Mines

You are a rich man, and recently you bought a place which contains some mines of rare metals like gold, platinum etc. As the metals are rare, their cost is also so high. So, you need to protect them from thieves. But things are not as easy as it looks.

So, you called a bunch of engineers to make some wired fences around the mines. As they were just engineers (not problem solvers!), they drilled some holes in random places. The idea was to put some pillars on the drilled holes and after that some wires should be set in the pillars, and finally electrifying the wires would be the completion. And of course, each mine should be surrounded by a fence. Wires should be placed between two pillars, in straight lines. The engineers drilled the holes in positions such that some of the mines might not be covered by any fences.

However, your plan is that, you can put some guards in mines that are not surrounded by any fence. To guard a single mine, it would cost **G** dollars, and a pillar cost is **P** dollars. As you are a rich man, the costs of wires are too small that they can be ignored. So, you want to put guards in some mines and surround some other mines by fences, but you want to find the optimal cost to protect all the mines. The fences may or may not be convex.

In bird's eye view, we can get the following figure (fig 1) for sample 1. There are seven pre-drilled holes (marked as circles), and six mine positions (marked as squares). The straight lines show the wires and the closed regions form the fences. The figure shows one of the optimal solutions.

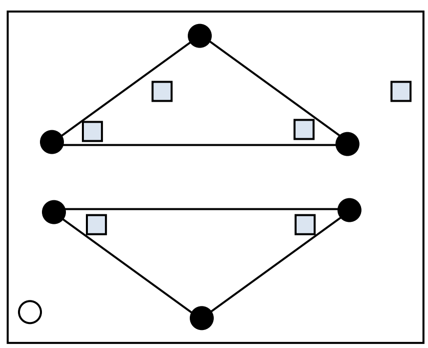

Fig 1

So, you have to find the minimum cost for executing your plan.

Input

Input starts with an integer **T (≤ 100)**, denoting the number of test cases.

Each case starts with a line containing four integers **N (3 ≤ N ≤ 100)**, **M (1 ≤ M ≤ 100)**, **G (1000 ≤ G ≤ 2000)** and **P (100 ≤ P ≤ 200)**, **N** denotes the number of pre-drilled holes, and **M** denotes the number of mines. This line is followed by **N** lines that describe the positions of the holes, and then by **M** lines that describe the positions of the mines. All positions are given as pairs of integers **x y** on one line **(0 ≤ x, y ≤ 1000)**. You can assume that no two positions (of holes and mines) coincide and that no three positions are collinear.

Output

For each case, print the case number and the minimum cost to protect all the mines.

Sample Input	Output for Sample Input
2 7 6 1000 100 0 0 20 0 1 10 39 10 1 20 39 20 20 30 3 9 37 9 3 21 37 21 18 24 50 24 4 3 1500 100 0 0 0 10 10 0 10 10 5 4 4 1 8 6	Case 1: 1600 Case 2: 300