The Little Bird

Filename: `bird`

One day, while playing in her backyard, a little girl came across an injured baby bird. Like any good kid would do, she picked it up and took it home and decided to take care of it until it got better. After it healed, she decided to give it flying lessons in her backyard. The girl's back yard is well-fenced, and the bird is safe inside the fence. However, she lives near the woods, which are filled with cats and foxes and thorny trees and many other things that might hurt the helpless little bird, and if the little bird were to land on or outside the fence, there's no telling what might happen to it! As a result of these dangers, the girl knows that until it is a strong flier, it will have to remain confined to the yard, so she wants to make sure that the yard is absolutely safe for the bird to practice in.

She knows that because the bird is still learning, it can fly at most a certain distance away from her before getting tired and landing. However, the bird may fly in any direction away from her when she releases it, and the yard is considered unsafe if flying in any direction could result in the bird landing on or outside the fence. The girl will be standing inside of her yard, at coordinates (0, 0) when she releases the bird. She also knows that her parents love geometry and have fenced their yard in such a way that it is a polygon whose internal angles are all less than 180 degrees.

The Problem:

Given the coordinates of the corners of the fence in clockwise order, and the maximum distance that the little bird can fly, determine whether or not a given yard is safe for the bird.

The Input:

The first line will contain a single, positive integer, t, representing the number of yards to be checked. Each yard will begin with a line containing two integers, r and n ($1 \leq r \leq 1{,}000$; $3 \leq n \leq 100$), representing the maximum distance that the little bird can fly and the number of corners in the fence, respectively. The next n lines will each contain two integers, x and y ($-1{,}000 \leq x \leq 1{,}000$; $1{,}000 \leq y \leq 1{,}000$), representing the coordinates of a corner of the fence.

The Output:

For each yard, output "`Yard #`*`i`*`: `*`m`*" where i is the number of the yard (starting with 1) and m is the message "`Fly away!`" if it is safe for the bird to fly in the given fencing layout or the message "`Better not risk it.`" if not.

Sample Input:

```
2
10 4
8 8
8 -8
-8 -8
-8 8
3 4
-6 7
7 8
9 -6
-7 -8
```

Sample Output:

```
Yard #1: Better not risk it.
Yard #2: Fly away!
```