

Problem C

Crop Circle Conundrum

Keke, a mischievous alien, has landed on Earth with a unique mission: to create an artistic crop circle on a farm! He visualizes the farm as an infinite hexagonal grid and wishes to paint certain cells to form his favorite pattern. More precisely, Keke uses a hexagonal coordinate system to divide the farm into hexagonal cells, with the farm's center as cell $(0, 0)$. See figure 1 for the coordinate system. Keke aims to paint a list of cells, with the i -th cell having coordinates (x_i, y_i) .

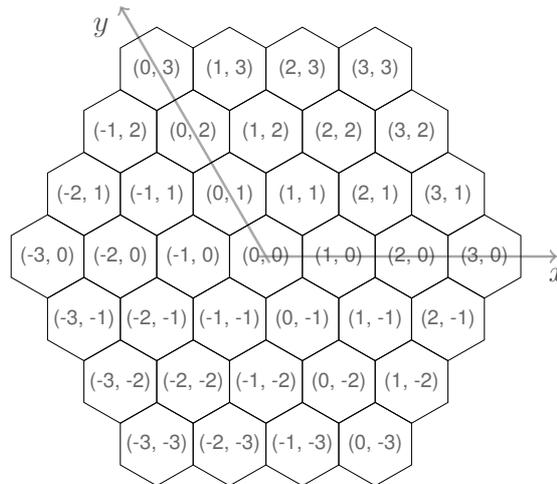


Figure C.1: Hexagonal coordinate system

Keke's spaceship is equipped with a specialized beam-gun capable of painting a star pattern on the farm. The size of a star pattern can vary between 2 and 666 (inclusive). See figure 2 for illustration.

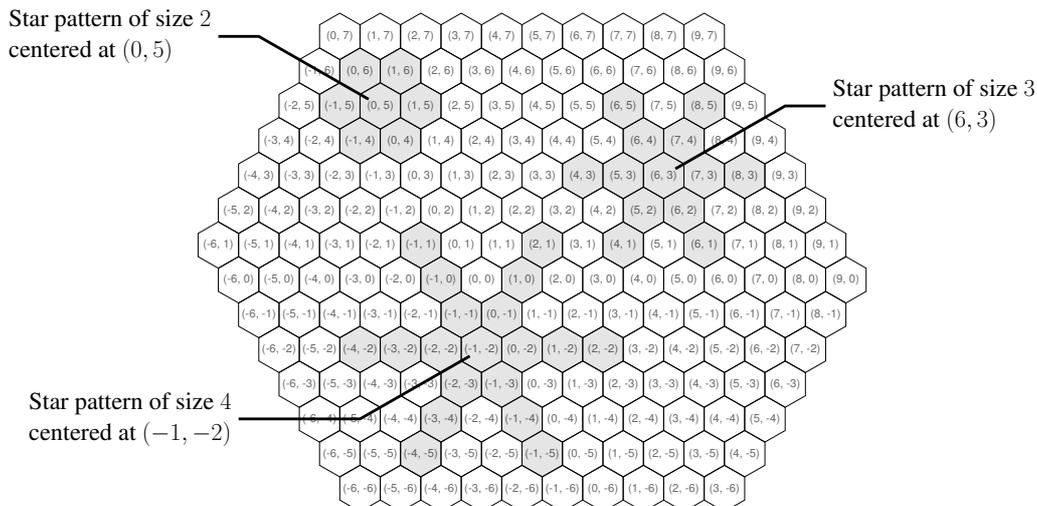


Figure C.2: Star patterns of size 2, 3 and 4

The beam-gun has a quirky property: if it hits a hexagonal cell twice, the cell reverts to its original state, effectively erasing the paint. Keke can fire the gun-beam up to 666 times. Keke has spent a few months trying to paint his favorite pattern, without success. Please help him!

Input

The first line of the input contains a single integer t ($1 \leq t \leq 6666$) – the number of test cases. t test cases follow, each is presented as below:

- The first line contains a single integer n ($0 \leq n \leq 66$) – the number of cells in Keke’s favorite pattern.
- In the next n lines, each contains two integers x_i and y_i ($0 \leq |x_i|, |y_i| \leq 6$) – the coordinate of the i -th cell in Keke’s favorite pattern. It is guaranteed that all n cells are distinct.

It is guaranteed that the sum of n over all test cases does not exceed 6666.

Output

For each test case, if there is no solution, print NO. Otherwise, print YES, followed by:

- a line containing a single integer k ($0 \leq k \leq 666$) – the number of times you want to use Keke’s beam-gun;
- k lines, the j -th one with three integers: x_j, y_j and r_j ($0 \leq |x_j|, |y_j| \leq 666, 2 \leq r_j \leq 666$), where (x_j, y_j) is the center where the gun-beam should target, and r_j is the size of the star.

If there are multiple correct solutions, you can output any of them.

Sample Explanation

The following figure illustrates Keke’s favorite pattern, with painted cells having a cross:

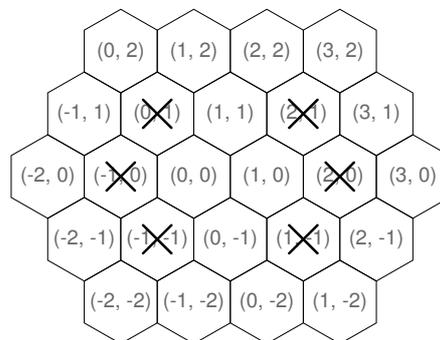
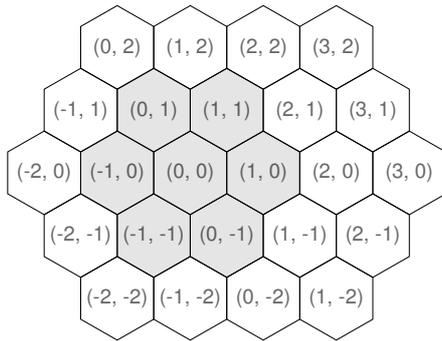
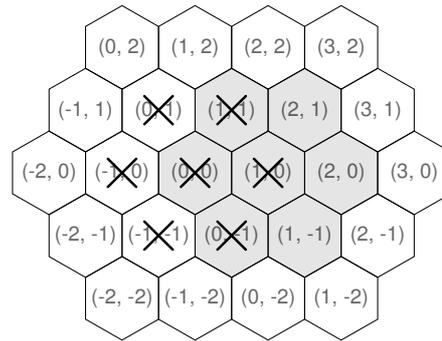


Figure C.3: Keke’s favorite pattern

Keke can perform the following operations with his beam-gun:



Step 1. Aim the beam-gun at cell (0, 0) and shoot with star size of 2.



Step 2. Aim the beam-gun at cell (1, 0) and shoot with star size of 2.

Sample Input 1

```
1
6
0 1
-1 0
-1 -1
2 1
2 0
1 -1
```

Sample Output 1

```
YES
2
0 0 2
1 0 2
```