Problem 225: Safety Perimeters

Difficulty: Easy

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Problem Background

When working with a manufacturing process, safety is always everybody's top priority, including at Lockheed Martin. Your team is helping to build a new manufacturing line for an experimental aircraft, and we need to ensure that there's a safe path through the line that ensures people won't come into contact with our machines or other equipment.

Problem Description

You'll be given the location of one of our manufacturing robots on our production floor along with a minimum safe distance from that robot. You'll also be given a series of points representing points along a proposed walking path through the production floor. For each of the points on the path, you'll need to determine if it is at a safe distance from the manufacturing robot.

Remember, you can use this formula to calculate the distance between two points:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Sample Input

The first line of your program's input, received from the standard input channel, will contain a positive integer representing the number of test cases. Each test case will include:

- A line containing a positive integer, N, representing the number of points along the path you will need to evaluate
- A line containing the following information, separated by spaces:
  - An integer representing the X-coordinate of a manufacturing robot, in centimeters
  - An integer representing the Y-coordinate of a manufacturing robot, in centimeters
  - A positive integer representing the minimum safe distance from the robot, in centimeters
- N lines containing the following information about points along the path, separated by a space:
  - An integer representing the point's X-coordinate in centimeters
  - An integer representing the point's Y-coordinate in centimeters

```
1
6
12 9 30
1 5
27 64
32 19
17 40
37 45
45 13
```

Sample Output

For each test case, your program must print a line for each point along the path in the order presented in the input, including:

- The point's coordinates, in (X,Y) format
- A space
- The word "SAFE" if the point is at a safe distance from the robot, or the word "DANGER" if it is not.

```
(1,5) DANGER
(27,64) SAFE
(32,19) DANGER
(17,40) SAFE
(37,45) SAFE
(45,13) SAFE
```