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## Circles (2)

P39799\_en

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To solve this exercise you will need the definitions and the procedures of problems P46254 and P84786.

Write a procedure that reads a point:

```
void read(Point& p);
```

which is in the input with the two reals  $x$  and  $y$  in this order.

Write also a procedure that reads a circle:

```
void read(Circle & c);
```

which is in the input with the three reals  $x$ ,  $y$ , and  $radius$  in this order.

Use all this to write a program that reads a circle  $c$  and an initial point  $p$ , and moves  $p$  according to the input, and prints when  $p$  go in or go out of  $c$ . Suppose that  $p$  will never be exactly in the border of  $c$ .

### Input

Input starts with a line with the circle  $c$  (three reals, the last one strictly positive) and a line with the point  $p$  (two reals). Then a natural number  $n$  comes followed by  $n$  lines, each one with a point that indicates the following move of  $p$ .

### Output

Your program must print the initial situation of  $p$  regard to  $c$ , and the moments that the point goes in or goes out of the circle. Follow the format of the examples.

#### Sample input 1

```
0 0 4.5
1 1
5
10 1
0 0
-10 -1
0.5 0.5
0 -20
```

#### Sample output 1

```
initially inside
in the step 1 has gone out
in the step 3 has gone in
in the step 5 has gone out
```

#### Sample input 2

```
5 10 2.5
2 2
3
-1 -1
-1 -1
-1 -1
```

#### Sample output 2

```
initially outside
```

## **Problem information**

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