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The Virtual Learning Environment for Computer Programming

Circles (2) P39799_en

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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Generation: 2026-01-25T10:41:27.088Z