



## 3835 - Highway

Europe - Southeastern - 2007/2008

Bob is a skilled engineer. He must design a highway that crosses a region with few villages. Since this region is quite unpopulated, he wants to minimize the number of exits from the highway. He models the highway as a line segment  $S$  (starting from zero), the villages as points on a plane, and the exits as points on  $S$ . Considering that the highway and the villages position are known, Bob must find the minimum number of exits such that each village location is at most at the distance  $D$  from at least one exit. He knows that all village locations are at most at the distance  $D$  from  $S$ .

### Input

The program input is from the standard input. Each data set in the file stands for a particular set of a highway and the positions of the villages. The data set starts with the length  $L$  (fits an integer) of the highway. Follows the distance  $D$  (fits an integer), the number  $N$  of villages, and for each village the location  $(x, y)$ . The program prints the minimum number of exits. White spaces can occur freely in the input. The input data are correct and terminate with an end of file.

### Output

For each set of data the program prints the result to the standard output from the beginning of a line.

An input/output sample is in the table below. There is a single data set. The highway length  $L$  is 100, the distance  $D$  is 50. There are 3 villages having the locations  $(2, 4)$ ,  $(50, 10)$ ,  $(70, 30)$ . The result for the data set is the minimum number of exits: 1.

### Sample Input

```
100
50
3
2 4
50 10
70 30
```

### Sample Output

```
1
```

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