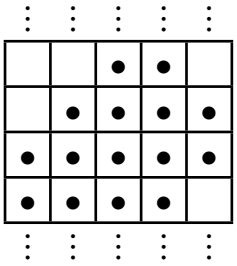
2012 PEBBLES

Through that small knot of villages known as *The Endians* meanders a river along whose bed are scattered pebbles long since rounded by ceaseless turmoil. These pebbles form patterns so regular that many have used them to argue for the existence of a higher being. Still others have claimed the patterns are caused by nothing more than chance. Yet others blame meddling kids.

The patterns are best seen by treating the river as a rectangular grid. When viewed as such it can be seen that every square in the grid is either empty or contains a single pebble and that *all* squares are adjacent to an even number of pebble containing squares — touching directly horizontally or vertically (but not diagonally).



For example, the diagram shows a possible part of the river, with ● indicating pebbles. In the diagram the full width of the river is shown but the river flows both before the diagram begins and afterwards.

Given the pebbles in two adjacent rows of the river it is possible to deduce the position of the other pebbles in the river.

SAMPLE INPUT

```
5 3
2
3
-1
```

SAMPLE OUTPUT

```
4
```

Write a program that deduces the position of pebbles further along the river. The first line of the input will two contain two integers, w ($1 \leq w \leq 100{,}000$) and r ($1 \leq r < 2^{31}$), giving the width of the river (in squares) and the number of rows further down the river for which you are to calculate the pebbles. The remaining lines will define a row of the river by indicating the position of its pebbles. Each successive line will contain a single integer indicating a pebble's position (the leftmost position being *0* and the rightmost *w-1*). The row's definition will be terminated by a line containing the single number `-1`. This row will contain at most 1000 pebbles.

You should consider the river as containing a row without pebbles followed by the input row. You should output a single integer, the number of pebbles in the row that is r rows after the input row.