ACM-ICPC Live Archive

3758 Walk Like an Egyptian

WALK LIKE AN EGYPTIAN is an old multi-player board game played by children of the Sahara nomad tribes. Back in the old days, children would collect stones, and number each one of them. A game with N players requires N^2 stones. Each player chooses N stones. The stones are then laid out on an $N * N$ grid in a peculiar order as in Figure (a) (for $N = 4$.) The player whose stone is placed in the top-right corner loses the round. Another round is then played but with $N - 1$ players. In total, $N - 1$ rounds are played to determine the winner.

16	15	14	13
5	6	7	12
4	3	8	11
1	2	9	10

Figure (a)

There is a story why the stones are arranged in this order. It is said that back in the days of the Pharaohs, when entering a dark room in a Pyramid, workers would use the following “algorithm” to be able to walk in the room without losing anybody: (see Figure (b)).

1. The first worker stands in the lower-left corner of the room.
2. The next three workers stand around the first forming a quarter of a circle by going in an anti-clockwise direction.
3. The next five workers stand around the last three, again forming a quarter of a circle but this time going in a clockwise direction.
4. The workers keep repeating the last two steps until the room is filled with workers. Each time they hit the left or bottom walls, they start a larger quarter circle and alternate their direction between clockwise and anti-clockwise.

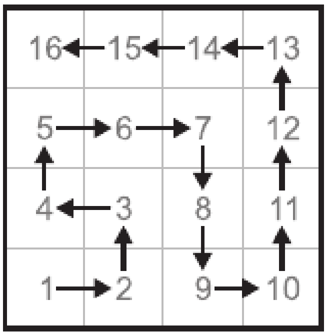

Figure (b)

Write a program that determines the stone placed on the top-right corner.

Input

Your program will be tested on one or more test cases. Each test case is specified on a separate input line. Each test case will specify the number of players N where $0 < N < 1,000$.

The end of the test cases is indicated by a line made of a single zero.

Output

For each test case, output the result on a single line using the following format:

N␣ =>␣*result*

Where N is the number of players for the this test case, and result is the number on the stone placed at the top-right corner of the grid.

Sample Input

```
4
2
0
```

Output

```
4 => 13
2 => 3
```