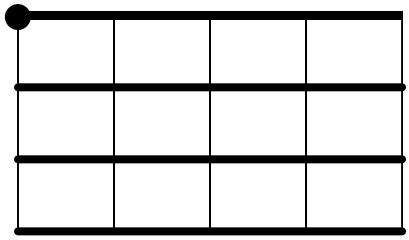
PROBLEM 8 - POSTAL VANS

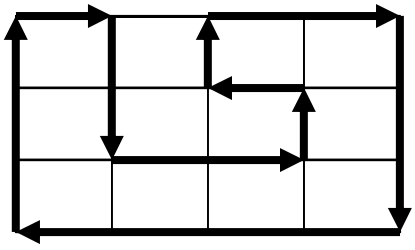
A new suburb has been established with 4 avenues running West–East and *N* streets running North–South, where $1 \le N \le 1000$. On the map, the suburb is a rectangular grid and the post office is at its North–West corner.

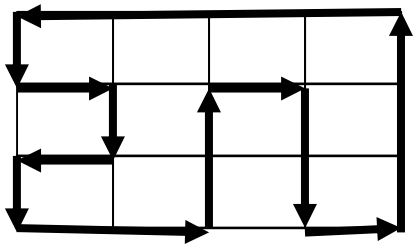
For example, the following diagram shows such a suburb with *N*=5 streets, with the avenues depicted as horizontal lines, and the post office as a dark blob at the top–left corner:



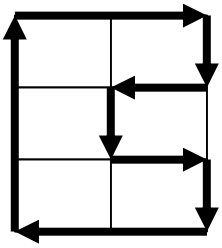
Each day the postal van leaves the post office, drives around the suburb and returns to the post office, passing exactly once through every intersection (including those on borders or corners). The executives from the post company want to know how many distinct routes can be established for the postal van (of course, the route direction is significant in this count).

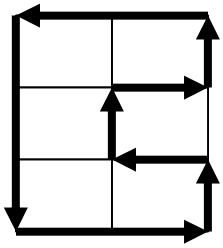
For example, the following diagrams show 2 such routes for the above suburb:

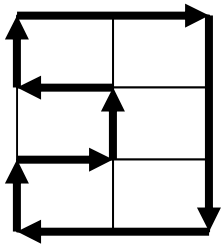


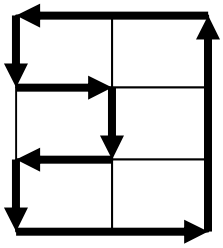


As another example, the following diagrams show all the 4 possible routes for a suburb with *N*=3 streets.









Write a program that will determine the number of such distinct routes given the number of streets.

Input Format

The input text consists of one or more lines, each containing a single number from 1 to 1000 inclusive – the number of parallel streets. A single '#' on a line by itself indicates the end of input.

Sample Input:

```
1
2
3
4
10
30
#
```

Output Format

There is a single line of output for each input value. Each output line consists of the number of streets followed by a colon (':') and a space, followed by the number of possible distinct routes corresponding to that many streets. Each number is displayed as a decimal number, with commas (',') used as separators between groups of 3 digits, counting from the right.

Sample Output:

```
1: 0
2: 2
3: 4
4: 12
10: 3,034
30: 374,605,036,706
```