

Problem 3: Making Stars

Everyone can make stars. A five-pointed star is usually drawn as shown (by the solid lines) in figure 1. Here the points of the star have been labeled 1 through 5. The usual procedure for drawing the star is to connect point 1 to point 3, point 3 to point 5, point 5 to point 2, point 2 to point 4, and finally connect point 4 to point 1. This is all done without lifting your pencil from the paper.

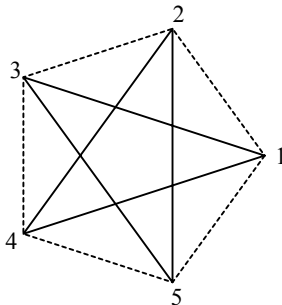


Figure 1

The formal procedure for drawing an n -pointed star (without lifting the pencil) is to begin with an n -sided polygon (shown with the dashed lines in figure 1). Pick any polygon vertex as a starting point, and then draw consecutive lines from one polygon vertex to another until you return to the starting vertex, skipping the same number of vertices, in the same direction (clockwise or counterclockwise) each time. A requirement is that we must skip at least one vertex between every pair of connected vertices, or else we just wind up tracing the edges of the polygon. Likewise, we must also skip fewer than $n-1$ vertices.

For example, with the 5-pointed star, we might start with vertex 1, skip vertex 2, and draw a line to vertex 3. We then skip vertex 4, and draw a line to vertex 5. Skipping vertex 1, we draw a line from vertex 5 to vertex 2. Skipping vertex 3, we draw a line from vertex 2 to vertex 4. Finally, we skip vertex 5, and draw a line from vertex 4 to vertex 1, completing the star.

We could also skip two vertices when drawing the 5-pointed star. This would result in connected vertex 1 to vertex 4 (skipping 2 and 3), then connecting vertex 4 to vertex 2 (skipping 5 and 1), then vertex 2 to vertex 5 (skipping 3 and 4), then vertex 5 to vertex 3 (skipping 1 and 2), and finally vertex 3 to vertex 1 (skipping 4 and 5). This is exactly the same star produced by skipping just one vertex. That is, the same vertices are connected by lines as in the earlier star.

It is not, however, always true that skipping different numbers of vertices will yield the same star. For example, there are two different 7-pointed stars that can be drawn, as shown in figure 2.

The question you are to answer in this problem is "how many different stars with n points can be drawn in this manner?"

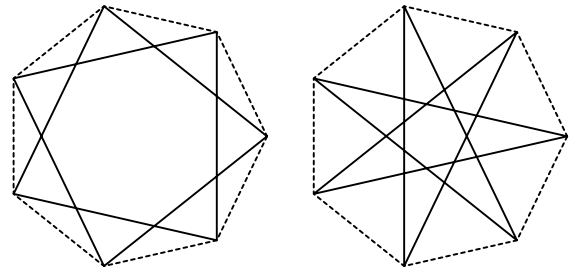


Figure 2

Input

There will be multiple cases to consider. The input for each case is a single integer n , between 5 and 500, that specifies the number of points in a star. The last case will be followed by the integer 0.

Output

For each input case, display the case number (1, 2, ...), the number of points (n), and the number of unique stars that can be drawn without lifting your pencil. Your output should follow the format shown in the examples below.

Sample Input

```
5
6
7
0
```

Expected Output

```
Case 1, n = 5, unique stars = 1
Case 2, n = 6, unique stars = 0
Case 3, n = 7, unique stars = 2
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