UVa 10079

From Algorithmist

Contents

10079 - Pizza Cutting

- http://uva.onlinejudge.org/external/100/10079.html

Summary

Given the number of straight cuts you can make on a pizza, find the maximum number of pieces in which the pizza can be divided.

Explanation

If we make no cuts at all, we still have the whole pizza to eat. Hence $A(0) = 1$. Each new cut can possibly intersect all the previous cuts. It means that After $n-1$ lines have been drawn, the nth line can intersect each of these, so it has $n-1$ intersections, and hence n new regions, so the recurrence we get is $A(n) = A(n-1) + n;\ A(0) = 1$. Solving this recurrence gives the formula $A(n) = n + (n-1) + (n-2) + ...2 + 1 + A(0)$ and hence $A(n) = n(n+1)/2 + 1$.

Implementation

- Use 64-bit integers (*long long* in C++) to avoid overflow.

Input

```
0
5
10
210000000
-100
```

Output

```
1
16
56
22050000105000001
```


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