11028 Sum of Product

Given n, there can be $n!$ circular arrangement of the numbers 0 to $n-1$.

Lets represent every permutation as $P_1\ P_2\ P_3\ \ldots\ P_{n!}$

$SOP(P_k)$ = sum of product of every two contiguous numbers in P_k.

Consider an example where $n = 4$ and $P_k = (1\ 3\ 2\ 0)$, therefore $SOP(P_k) = 1*3+3*2+2*0+0*1 = 9$.

You have to find out the number of distinct values of $SOP(P_k)$ for $k = 1$ to $n!$.

For $n = 3$,

P_k	Permutation	$SOP(P_k)$
P_1	0 1 2	2
P_2	0 2 1	2
P_3	1 0 2	2
P_4	1 2 0	2
P_5	2 0 1	2
P_6	2 1 0	2

So, for $n = 3$, there is only 1 distinct value of $SOP(P_k)$.

Input

There will be multiple test cases. Each case consists of a line containing a positive integer n ($1 < n \leq 20$). The last line of input file contains a single '0' that doesn't need to be processed. The total number of test cases will be at most 30.

Output

For each case, output the case number followed by the number of distinct SOPs.

Sample Input

```
3
4
6
0
```

Sample Output

```
Case #1: 1
Case #2: 3
Case #3: 21
```