

11276 Magical Seven

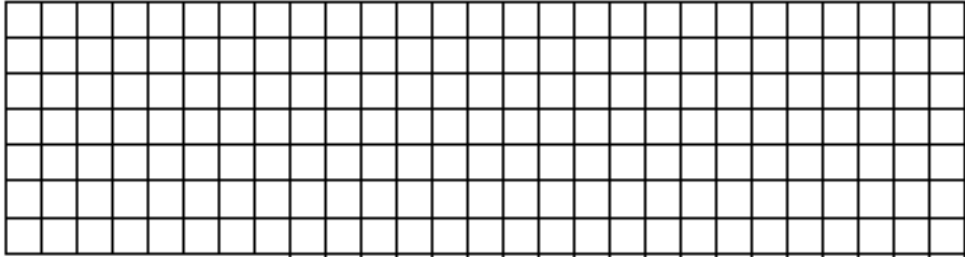
7 is a very special number. It is the smallest number that can't be represented as a sum of fewer than four non-zero squares. It is also the smallest happy number greater than 1. 7 is considered to be magical in many cultures. In this problem, you will discover the amazing hidden magic of 7 in graph theory :-).

Given a grid graph G , with dimensions $7 \times n$, as shown below (the vertices are at the center of the grid cells). Compute the last 4 digits of $A + B + C$, where

A = The total number of different Perfect matchings of G . A Perfect matching is a matching which covers all vertices of G .

B = The total number of different Hamiltonian cycles of G . A Hamiltonian cycle visits each vertex exactly once and comes back to the original vertex.

C = The total number of different Spanning subgraphs of G , such that every connected component of each Spanning subgraph is a cycle.



Input

The input will consist of at most 100 lines with the value of n on each line. All numbers fit into unsigned 64 bit integers.

Output

For each line of input, output the answer on a single line. If there are fewer than 4 digits in $A + B + C$, pad to 4 digits with leading 0's, otherwise output the last 4 digits as described above.

Sample Input

```
1
2
6
10
```

Sample Output

```
0000
0030
5900
5765
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