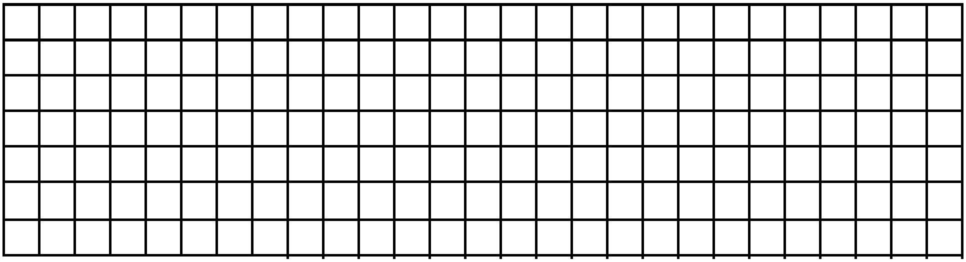
7 is a very special number. It is the smallest number that can't be represented as a sum of fewer than four non-zero squares. It is also the smallest happy number greater than 1. **7** is considered to be magical in many cultures. In this problem, you will discover the amazing hidden magic of **7** in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