A binary search tree is a binary tree with root k such that any node v reachable from its left has $label(v) < label(k)$ and any node w reachable from its right has $label(w) > label(k)$. It is a search structure which can find a node with label x in $O(nlogn)$ average time, where n is the size of the tree (number of vertices).

Given a number n, can you tell how many different binary search trees may be constructed with a *set* of numbers of size n such that each element of the set will be associated to the label of exactly one node in a binary search tree?

Input

The input will contain a number $1 \leq i \leq 1000$ per line representing the number of elements of the set.

Output

You have to print a line in the output for each entry with the answer to the previous question.

Sample Input

```
1
2
3
```

Sample Output

```
1
2
5
```