Distinct Ways to Cut a Rod

Time Limit: 2 seconds

Problem Description

Recall the rod cutting problem mentioned in the textbook. The number of ways to cut a rod of length n into pieces of integral length is 2^{n-1}, since there are $n-1$ possible cutting points. However, some ways seems to be equivalent since the total prices are the same. For example, there are three ways to cut a rod of length 4 into 3 pieces of lengths 2, 1, 1, respectively, but the total prices are the same. We define two ways of cutting are distinct if they generate distinct sets of pieces. Note that $\{1, 1, 2\}$ and $\{2, 1, 1\}$ are not distinct. Please write a program to compute the number of distinct ways to cut a rod of length n.

Technical Specifications

1. The number of test cases is no more than 200.
2. Basic input: $0 < n \leq 200$
3. Hard input: $0 < n \leq 5000$
4. The file size of your source code should be less than `128kb`.

Input Format

The first line of the input file contains an integer indicating the number of test cases. Each test case has exactly one line containing the length n of the rod.

Output Format

For each test case, the number of distinct ways to cut the rod.

Sample Input

```
5
2
4
6
200
5000
```

Sample Output

```
2
5
11
3972999029388
169820168825442121851975101689306431361757683049829233322038246523291443 49
```