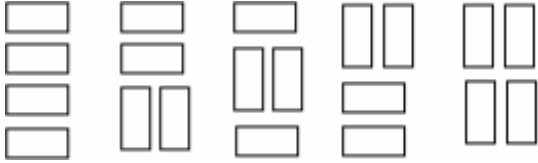


Tiling a Grid With Dominoes

We wish to tile a grid 4 units high and N units long with rectangles (dominoes) 2 units by one unit (in either orientation). For example, the figure shows the five different ways that a grid 4 units high and 2 units wide may be tiled.



Write a program that takes as input the width, W , of the grid and outputs the number of different ways to tile a 4-by- W grid.

Input

The first line of input contains a single integer N , ($1 \leq N \leq 1000$) which is the number of datasets that follow.

Each dataset contains a single decimal integer, the width, W , of the grid for this problem instance.

Output

For each problem instance, there is one line of output: The problem instance number as a decimal integer (start counting at one), a single space and the number of tilings of a 4-by- W grid. The values of W will be chosen so the count will fit in a 32-bit integer.

Example

Input:

3
2
3
7

Output:

1 5
2 11
3 781