Stacking of manilla folders

Problem; How many ways to stack n (identical) manilla folders, upright, nested, into your carrying bag are there?

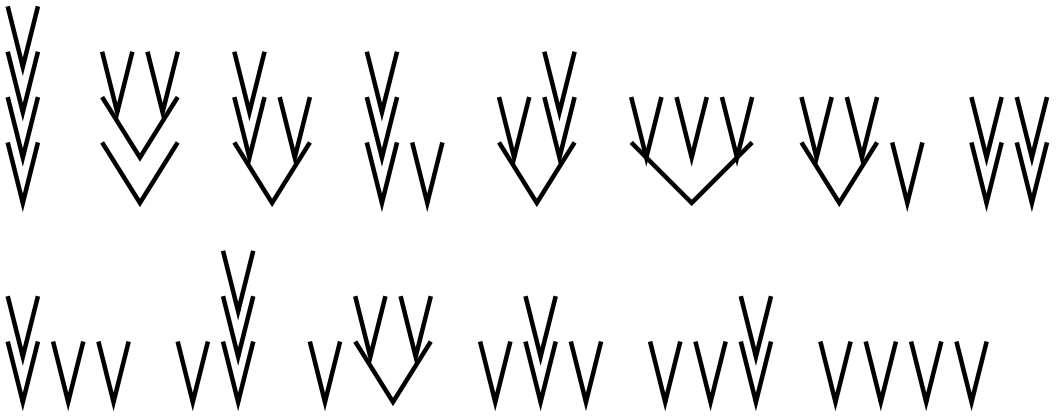
For $n = 0$, there is 1 way.

For $n = 1$, there is also 1 way:

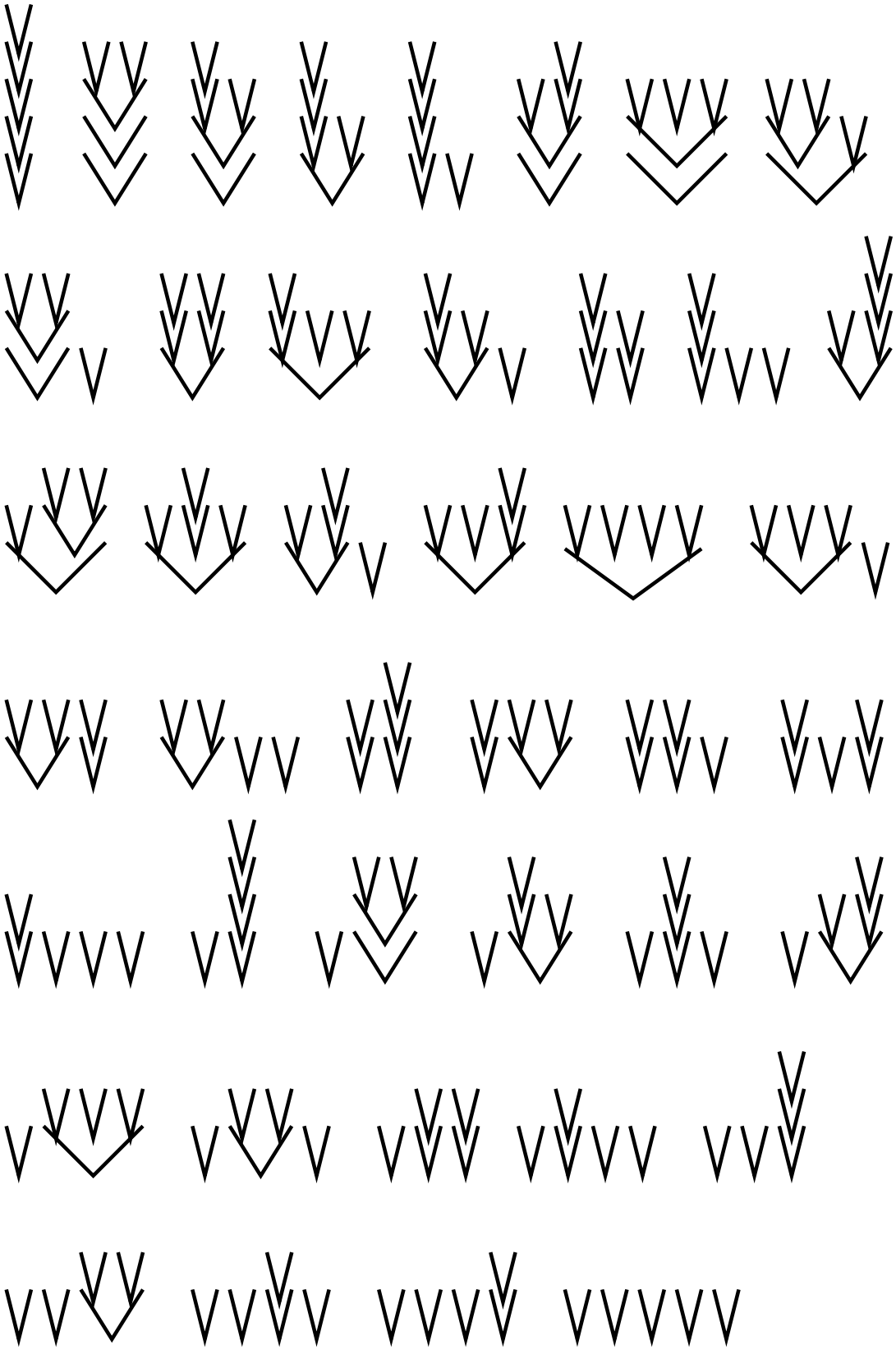
For $n = 2$, there are 2 way:

For $n = 3$, there are 5 way:

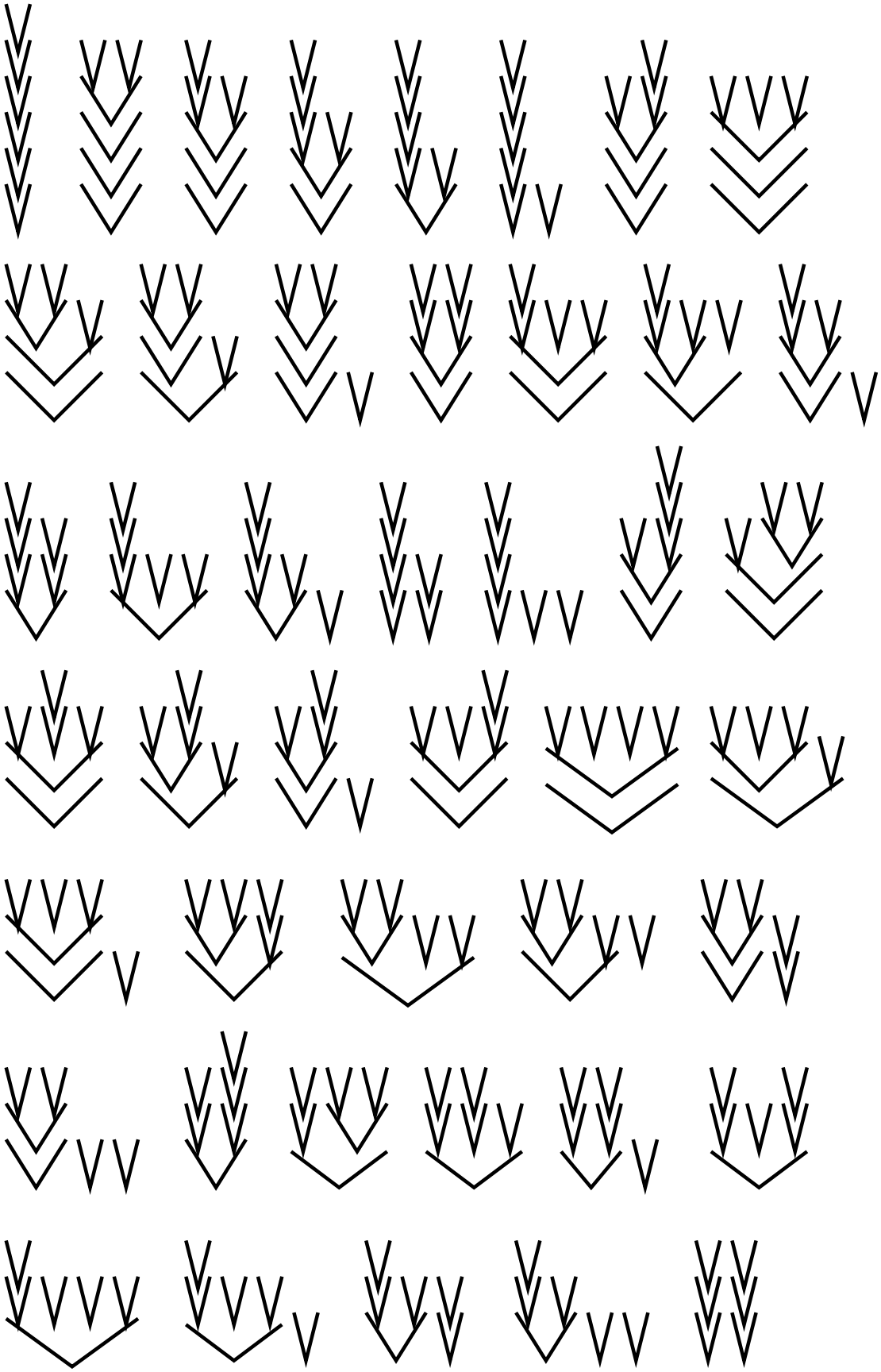
For $n = 4$, there are 14 way: :

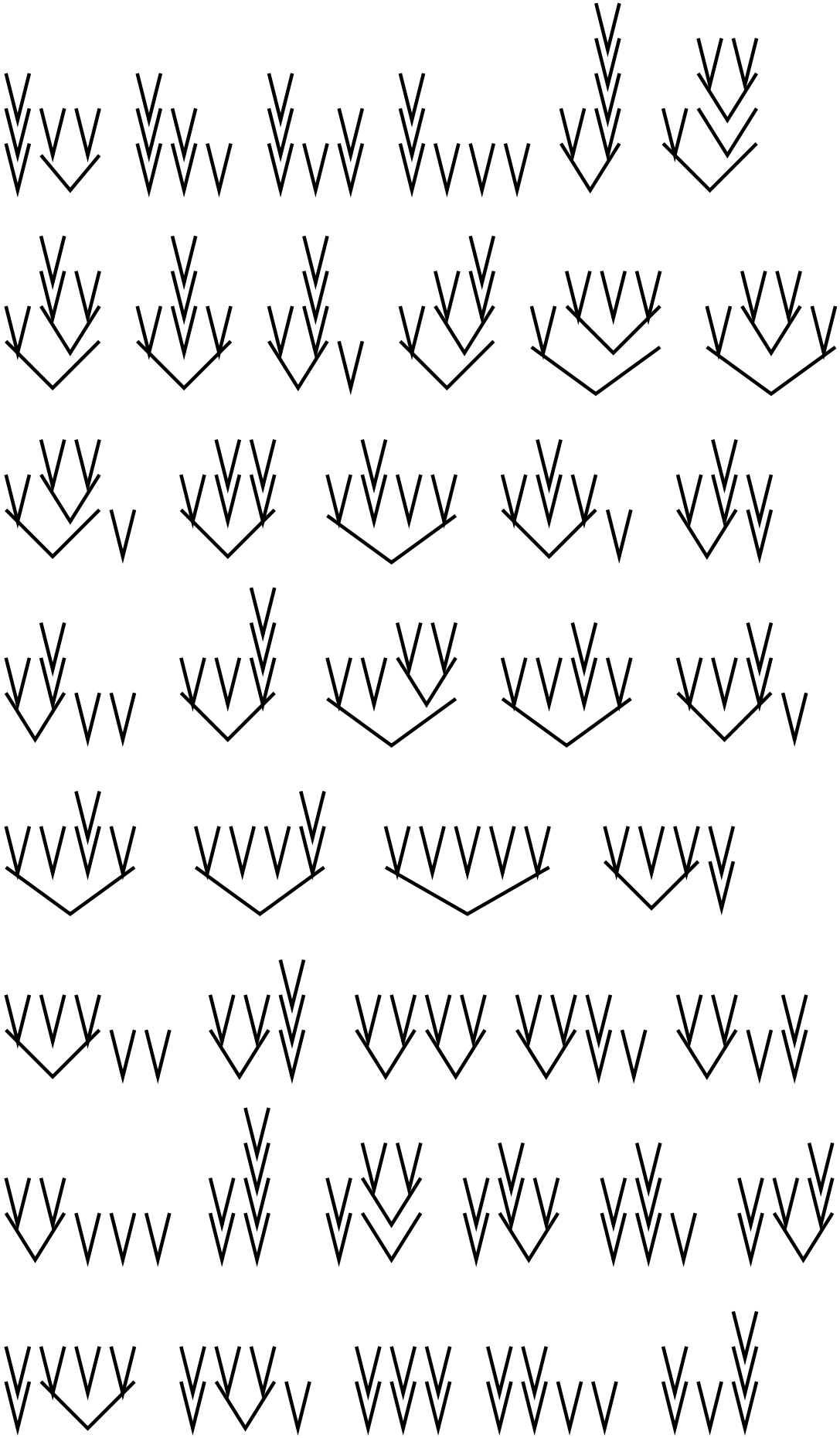


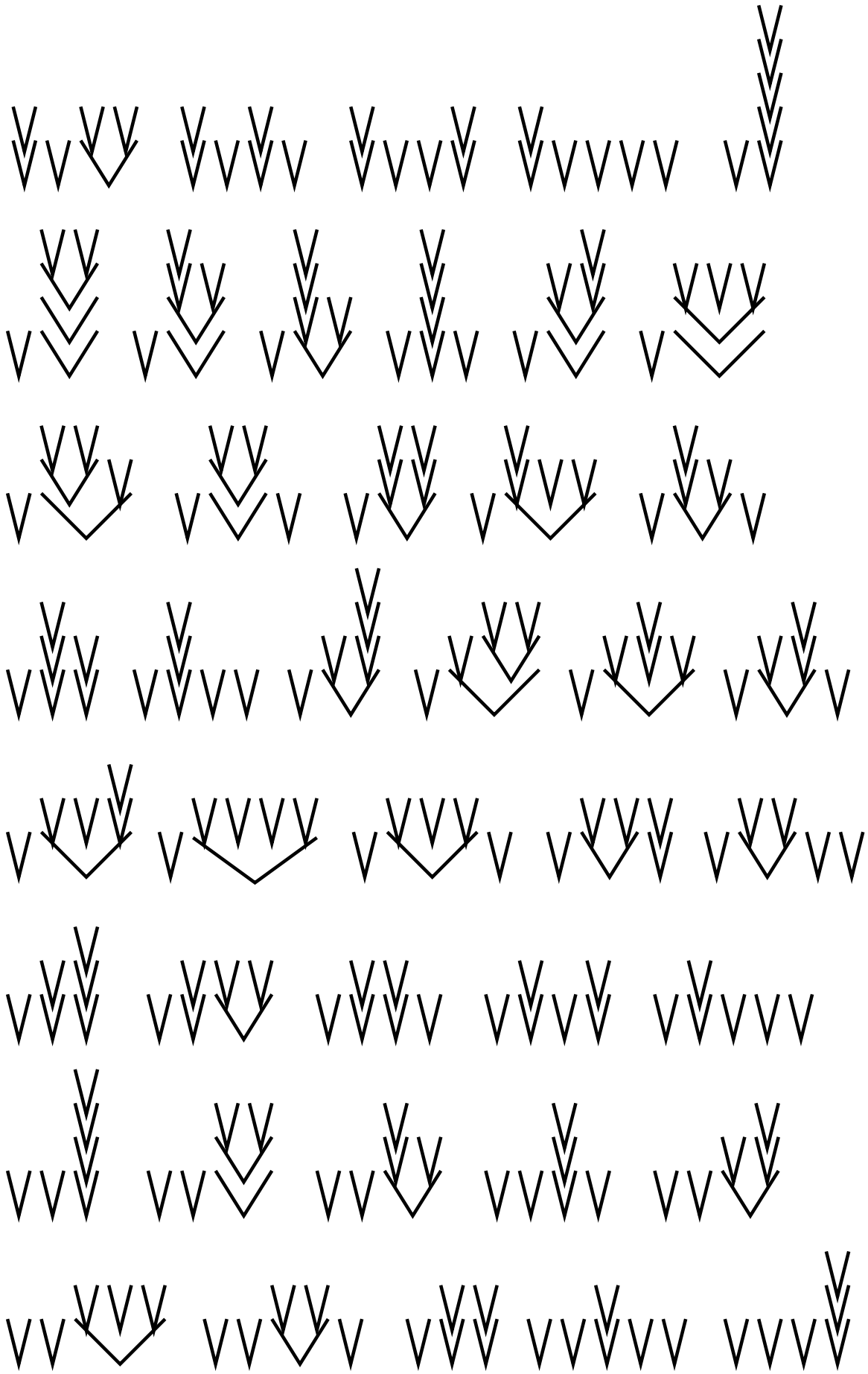
For $n = 5$, there are 42 way:



For $n = 6$, there are 132 way:







Connecting with the first bracketing problem

Given a balanced string of left and right brackets, to obtain the corresponding string of circles, we replace a matching pair LR by a manilla folder.

Given a stacking of manilla folders, to obtain a balanced string of left and right brackets, we replace a folder by a matching pair LR.

1. For each of the following balanced strings of letters L and R, write down the corresponding stacking of manilla folders.

(i) LLLRLRRLRR

(ii) LLRRLLRLRRLR

(iii) LLLRRRLRLLRR

Solution.

The corresponding stacking of manilla folders are:

(i) (ii) (iii)

2. For each of the following strings of circles, write down the corresponding balanced strings of brackets.

(i) (ii) (iii)

Solution.

The corresponding balanced strings of brackets are

(i) LLRRLRLLRLRR

(ii) LLRLRRLLRRLRLR

(iii) LLRLRLRRLRLLRRLLRLRR