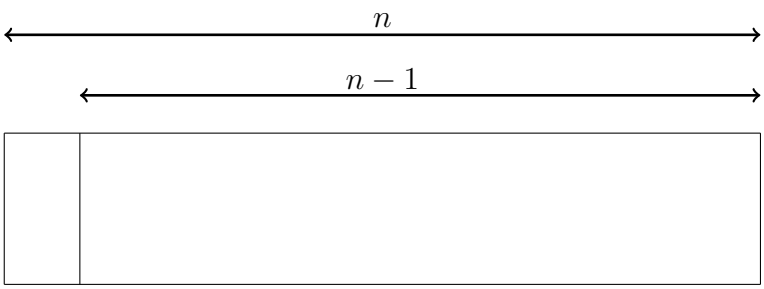
THIS DOC SHOULD NOT HAVE HEADER AND FOOTER, NO TITLE.

How many ways are there to tile a 2-by-12 rectangular region completely with 2-by-1 tiles?

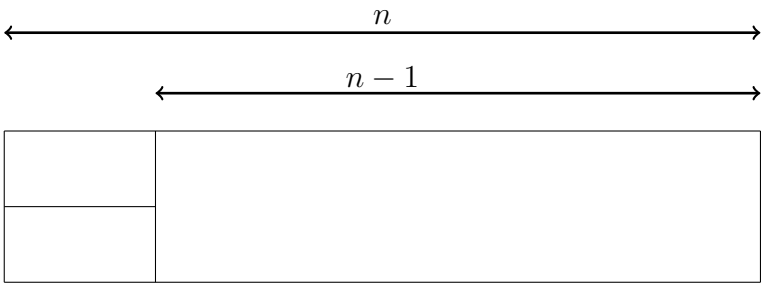
Let a_n be the number of ways to put 2-by-1 tiles in a 2-by-n rectangular region. Tiling left-to-right, the leftmost part of the 2-by-n region can be tiled by either

1. a vertical 2-by-1 tile with a remaining 2-by-$(n-1)$ to be tiled,



or

2. two horizontal 1-by-2 tiles with a remaining 2-by-$(n-2)$ region to tile.



Therefore

$$a_n = a_{n-1} + a_{n-2} \tag{1}$$

for $n \geq 2$. Furthermore $a_1 = 1$ and $a_2 = 2$. Using (1), we obtain $a_{12} = 233$.

(Using (1), we see that $a_0 = 1$. and therefore the sequence $a_0, a_1, ...$ is the standard Fibonacci sequence.)