Part I: An L-triomino is a tile shaped like a $2 \times 2$ grid with one corner missing. A monomino is a single $1 \times 1$ square. How many ways there are to tile a $2 \times n$ chessboard with L-triomino’s and monomino’s? For example, if $n = 2$, the answer is 5.

(note: the L-triomino’s may be turned in any of the four ways, and we may use as many as we like of either tile)