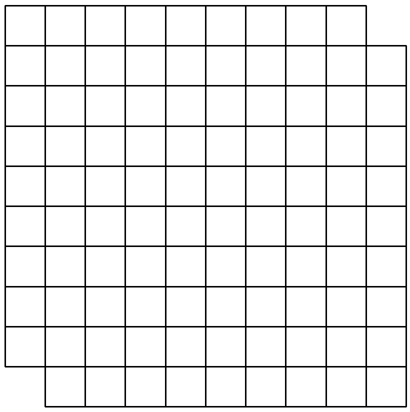
1. Two opposite corner squares are removed from the 10×10 checkerboard to obtain the board shown. Is it possible to tile the board with dominoes?



2. In how many distinct ways can a 2×18 board be tiled with dominoes? For example, there are three tilings of the 2×3 board shown below. If all three dominoes are placed vertically we could denote this by $\{\{1,4\},\{2,5\}\{3,6\}\}$. The other two tiling are $\{\{1,2\},\{4,5\}\{3,6\}\}$ and $\{\{1,4\},\{2,3\}\{5,6\}\}$

1	2	3
4	5	6

3. Is it possible to tile a 9×9 board with 40 dominoes and one monominoe? If so, can the monominoe be placed anywhere on the board? What about other boards with an odd number of squares? Develop a conjecture and prove it.

4. Assuming polyominoes can be turned over, how many distinct pentominoes are there? The assumption means, for example, that  and  are indistinguishable.