Experiments in Progress

These are new puzzles that aren't finished yet. You can try them out and let me know what you think.

- **Dominosa** is the dominoes puzzle where you have to fit the set of dominoes into a grid of numbers.
- **Adding Donimoes** is a puzzle I designed where you add dominoes in the given order.
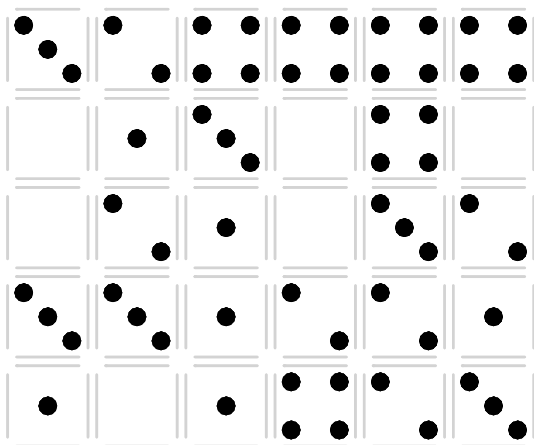
Dominosa

The domino puzzle I often see is called either Dominosa or Domino Solitaire. You start with a grid of numbers, and you have to lay the dominoes on them. It was invented by O.S. Adler in 1874. There's an interesting proof that this puzzle is NP-hard.

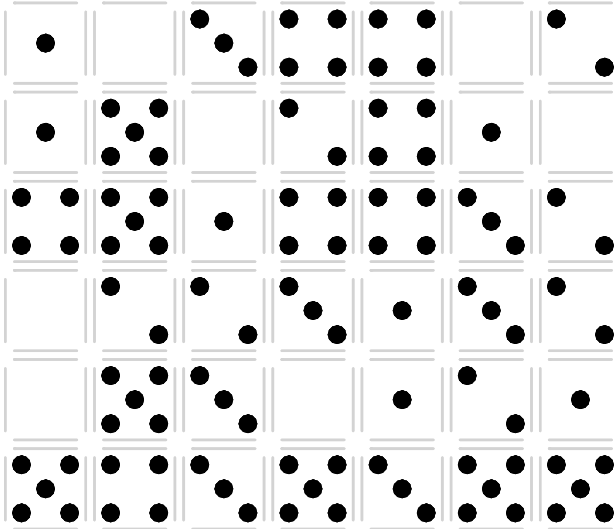Reiner Knizia published some puzzles called Domino Knobelspass that are very similar to Dominosa.
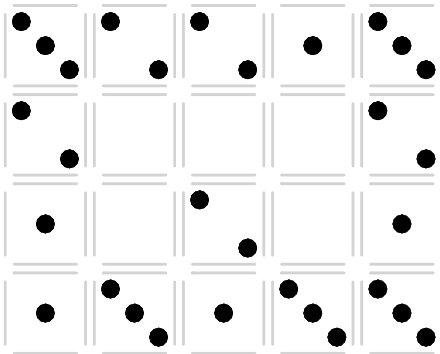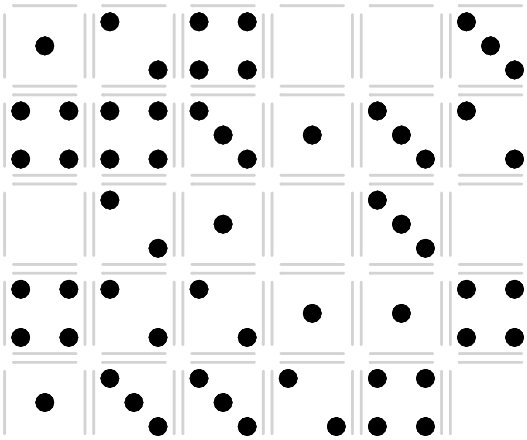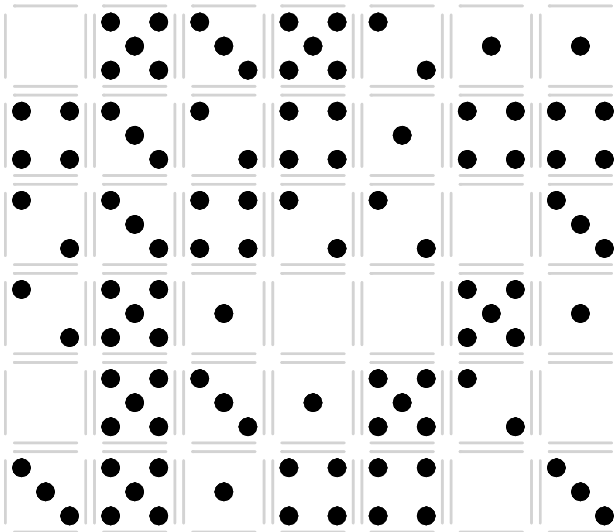
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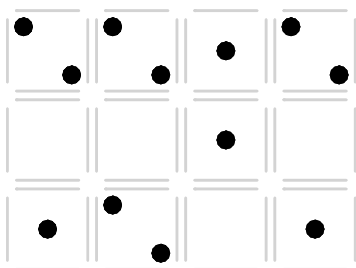
Problem 2

Problem 3

Problem 4

Problem 5

2

Problem 6

Problem 7
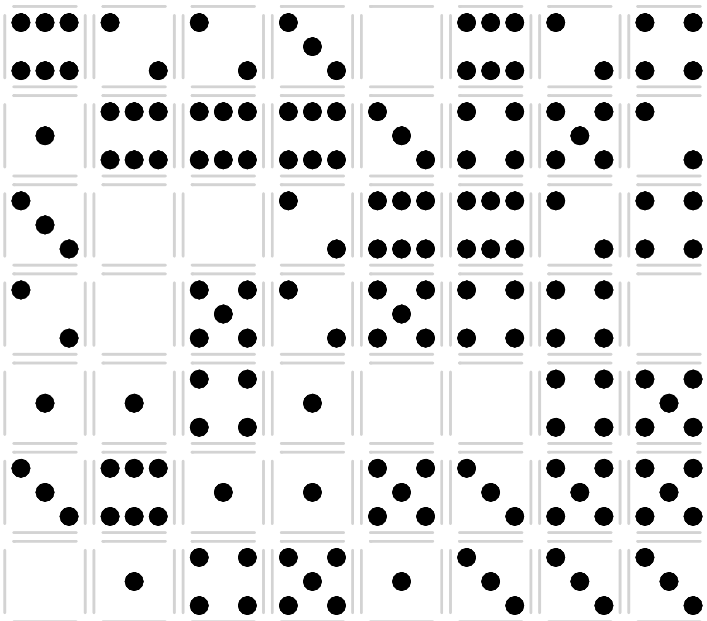
Problem 15
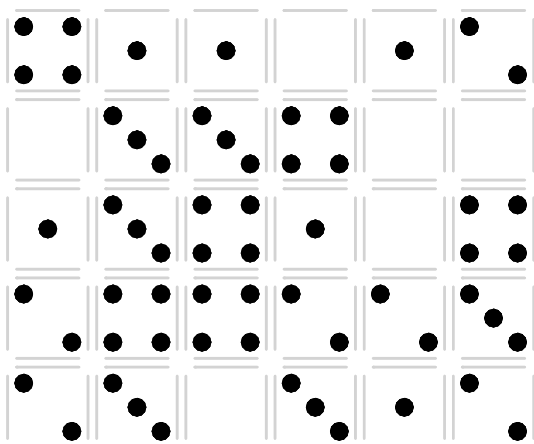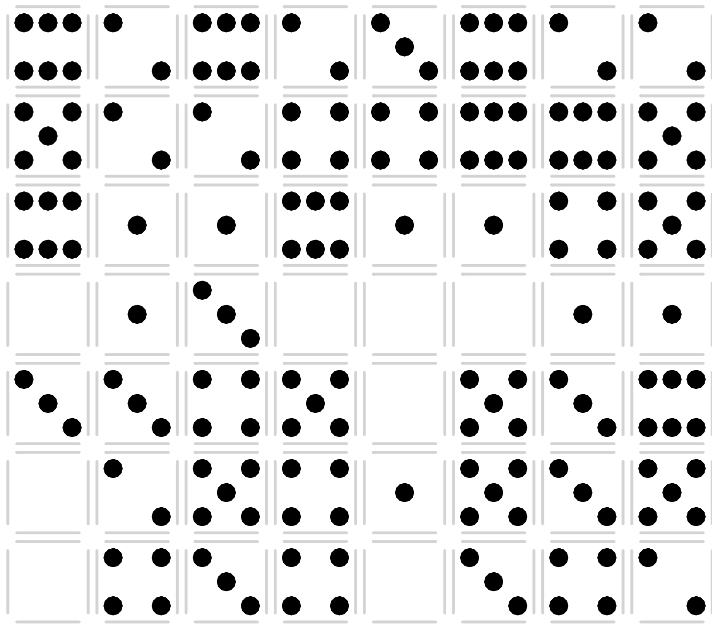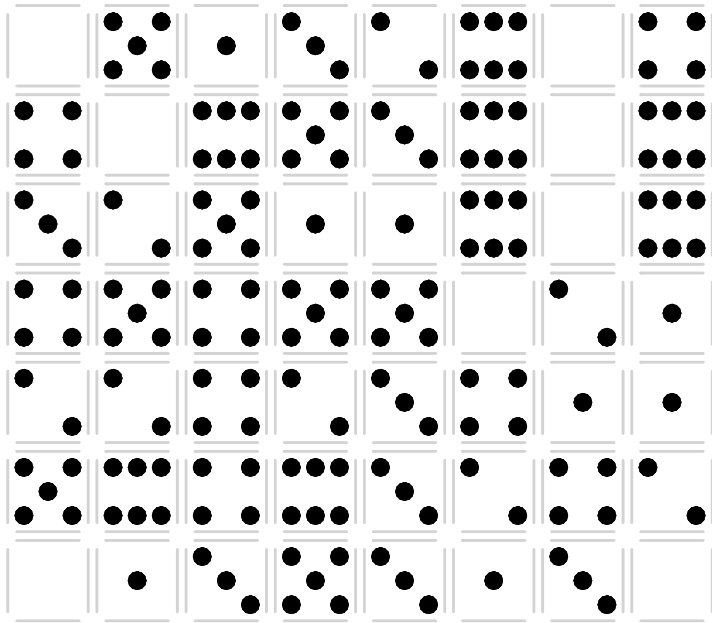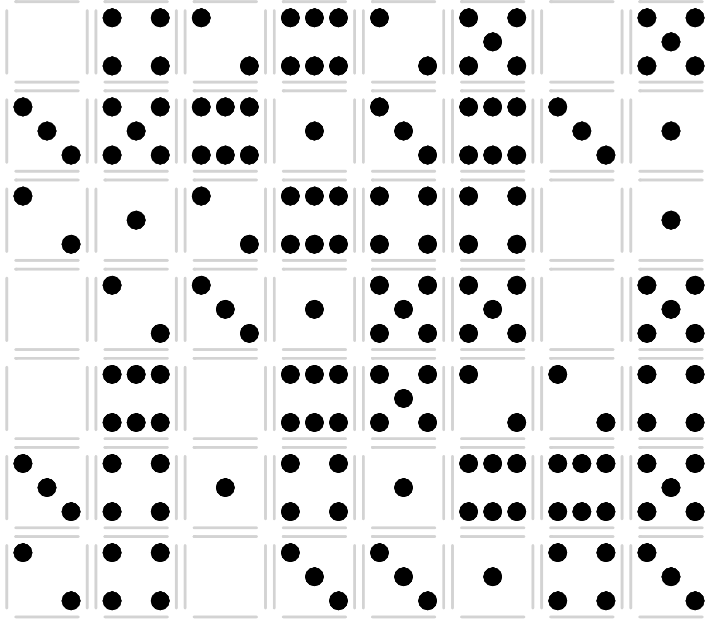
Problem 16

Problem 17

4
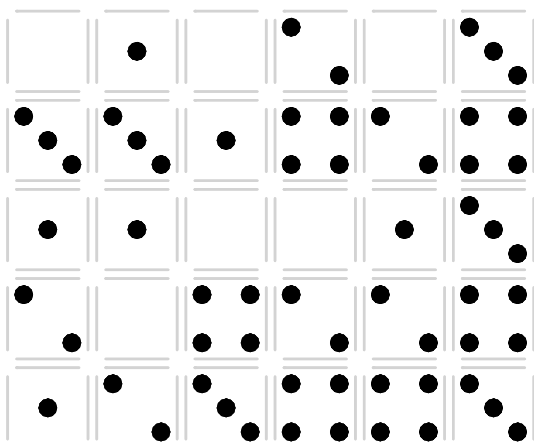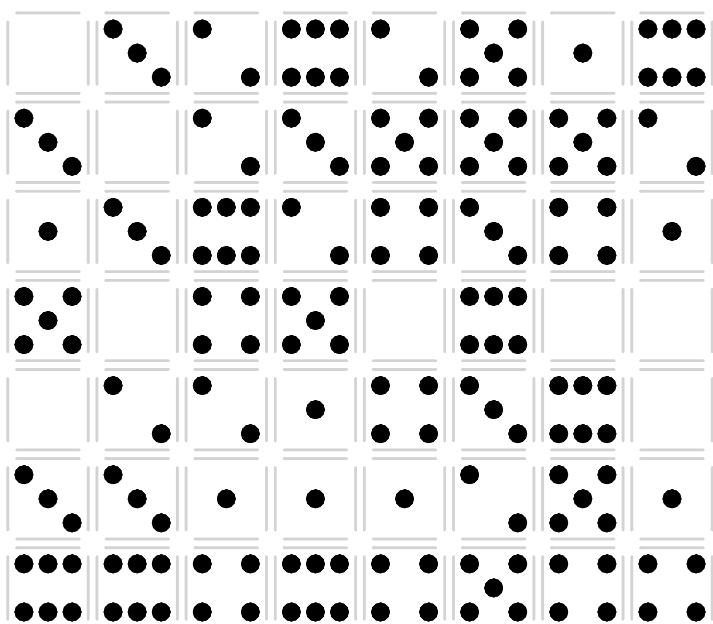
Problem 18

Problem 19

Problem 20

Dominosa Strategy

There are several methods to deduce where the dominoes must be placed, and it's helpful to record on the puzzle, not only where the dominoes can be, but also where they can't be. Here are some rules to help you make progress:

1. Look for a cell that only has one neighbour, and join it with its neighbour. Particularly check near the last pair you joined.
2. If you have a newly joined pair of numbers, check if the same pair appears elsewhere. Split the other location, because you can't have two dominoes the same. Also check all of the other neighbours that the newly joined pair might have joined with. Those pairs of numbers might now be unique.
3. If you have a newly split pair of numbers, look for the same pair elsewhere on the board to see if there is only one pair like them. If so, join them.
4. If all of a space's available neighbours are the same, you know it will join one of them. Look for the same pair of numbers elsewhere on the board, and mark them as split.
5. If a pair of undecided numbers appears more than once on the board, but all of the pairs share one space, then you know that space must join to the other number. Mark any other available neighbours as split.
6. Look for unique pairs of numbers, and mark them as joined. (This is the tedious part, so I try to only require it once or twice in each puzzle.)
7. If two unsolved areas are joined by a narrow neck, you know that both areas must have an even number of spaces in them. That will tell you where you can split or join the spaces in the neck.
8. If none of the other rules apply, guess at a domino's placement by marking a pair as joined. If it later causes a contradiction, backtrack and mark it split. (This would be very frustrating when solving, so none of the problems in this collection require it.)

The easiest puzzles in this collection only require a couple of these rules, and then the later puzzles require more and more different rules to solve.

Adding Donimoes

The idea was to avoid the slow setup phase at the start of the other puzzles.
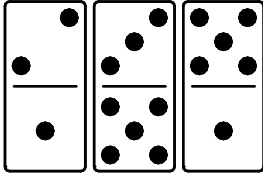
Goal

The goal is to add all the dominoes from the queue onto the board. Each problem shows the queue of dominoes to add, from left to right.
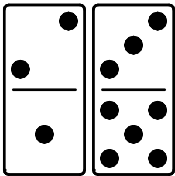
Start

Take the two dominoes from the left end of the queue and place them on the board in the same position relative to each other.
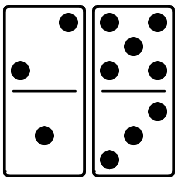
For example, if this is the queue:

Then the start position is like this:

Not like this:

## Moves

There are only two ways a domino can move.

Adding

The next domino from the queue can be added to the board if it matches at least two of the adjacent numbers on neighbouring dominoes. Those two adjacent numbers can match the two ends of the domino, or both match one end.

In this example, the 13 can be added, because it matches the 1 below and the 3 below.
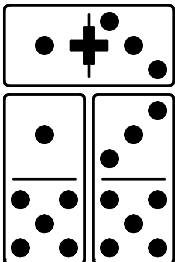
In this example, the 52 can be added, because it matches the 5 beside and the 5 above. The 52 could also be added in the vertical position.
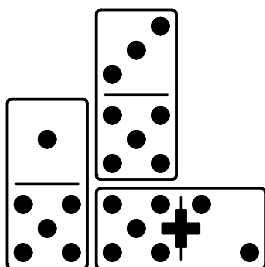
Sliding

Move a domino one space along its long axis so that it ends up with at least one of its numbers next to an adjacent number that adds up to six, or it matches at least two of the adjacent numbers on neighbouring dominoes.

In this example, the left domino can move down, because the 1 and the 5 add to six.
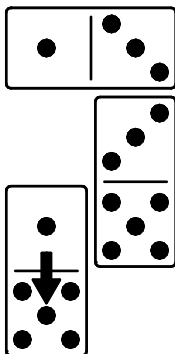
The left domino can move back up, because the 1 matches the 1 above, and the 5 matches the 5 to the right.
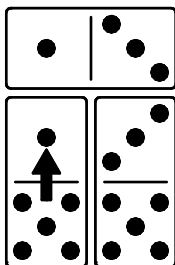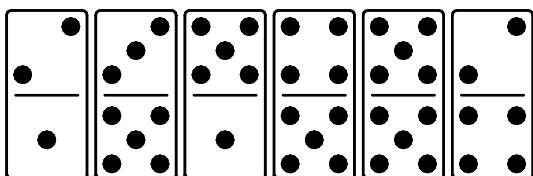

Stay Connected

All the dominoes on the board must stay in one connected group, you can't split the group after moving a domino.

Problems

Here are the starting positions for several Capturing Donimoes problems. The solutions are listed at the end.
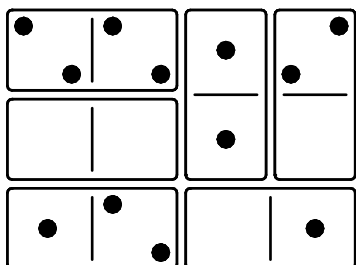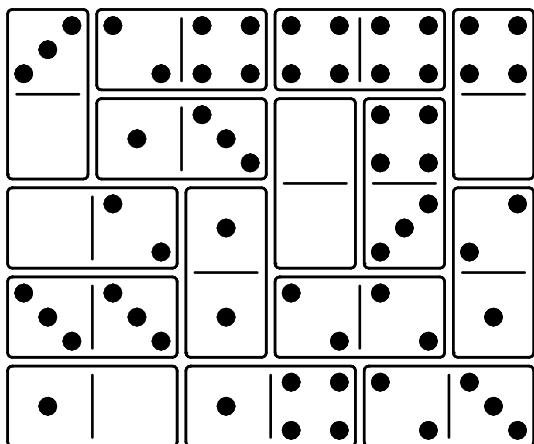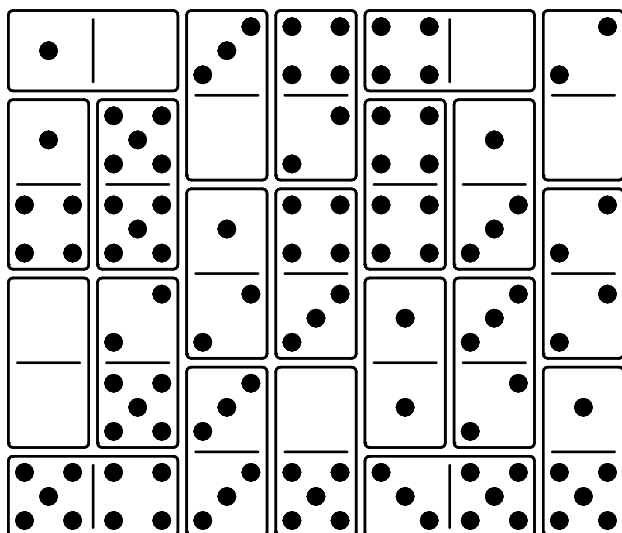
Problem 1
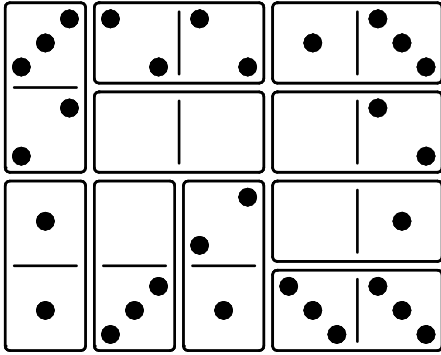
Solutions

Dominosa Solutions

Solution 1

Solution 2

Solution 3

Solution 4

Solution 5
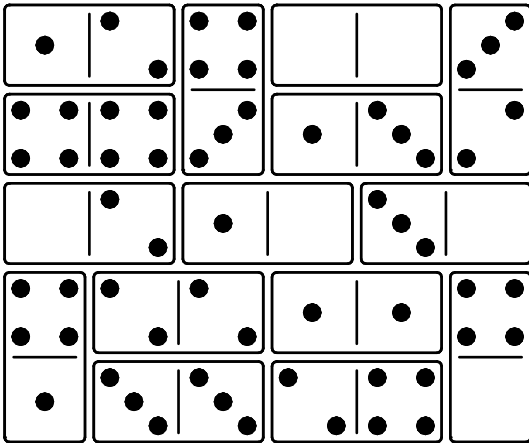
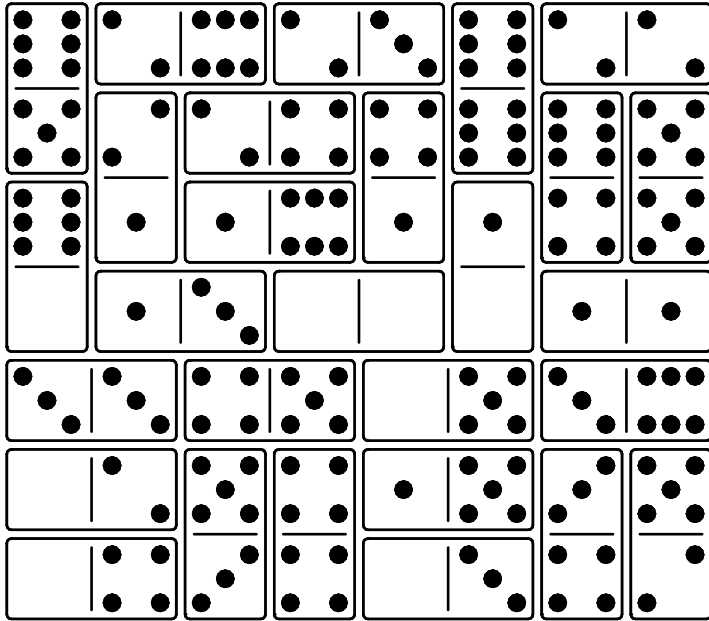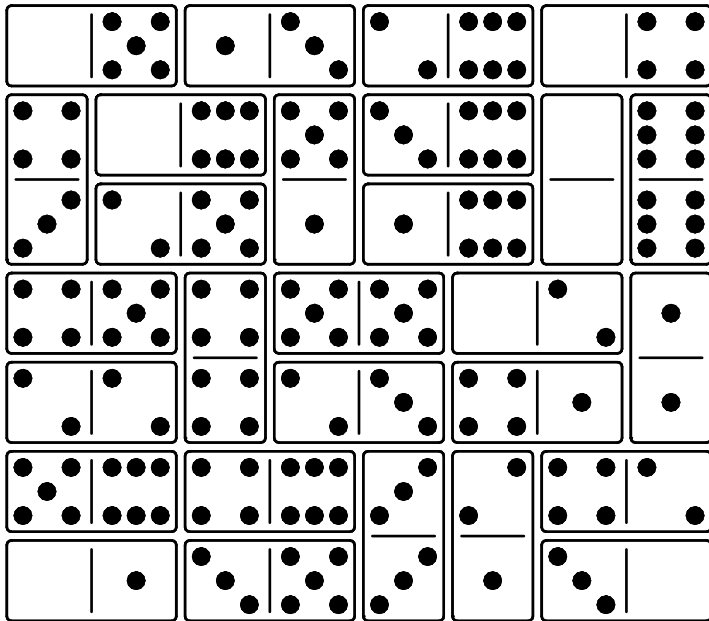## Solution 6
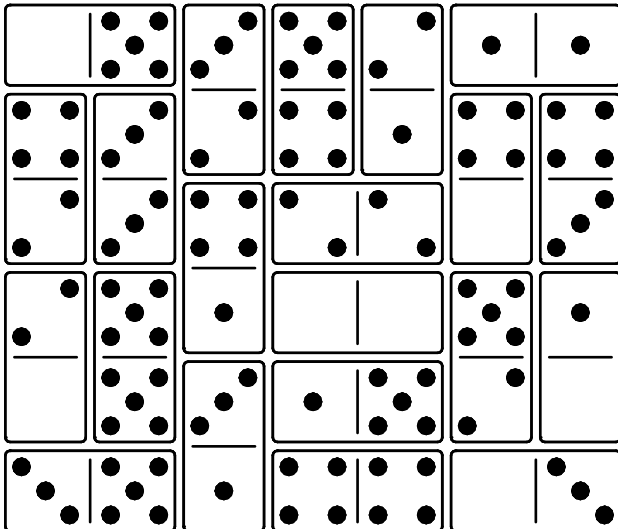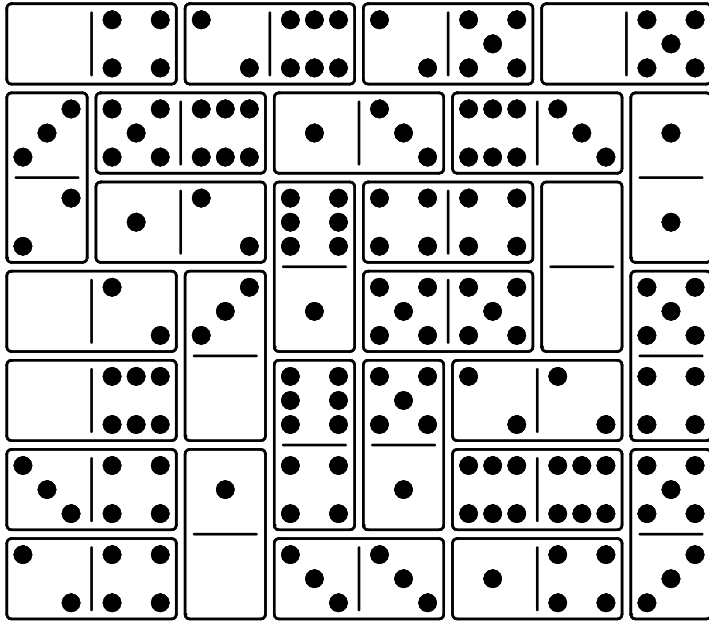
Solution 7
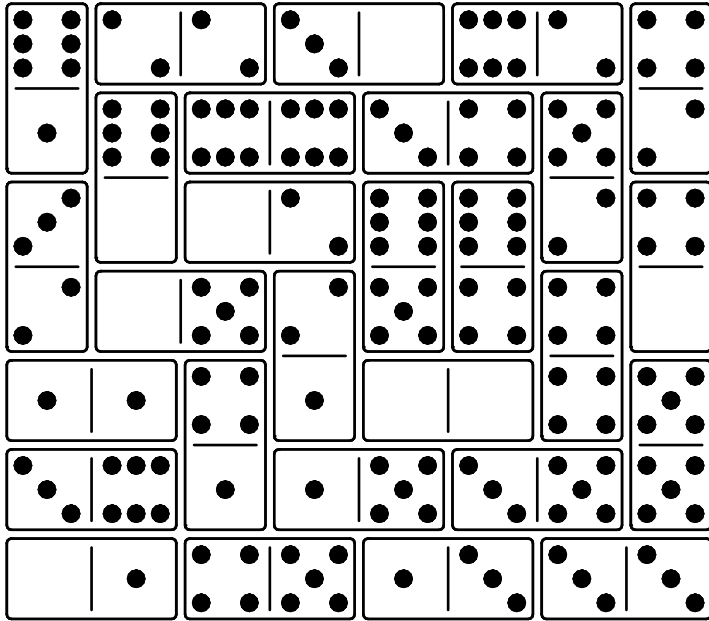
Solution 15
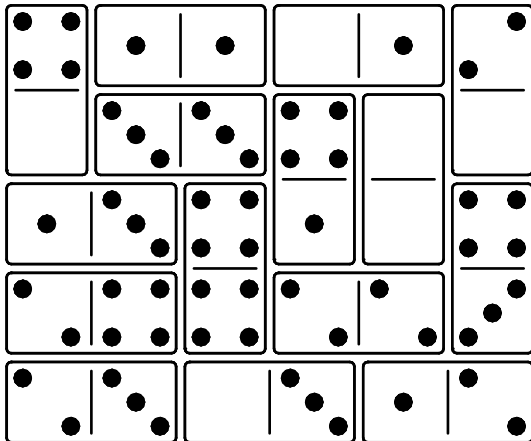
Solution 16
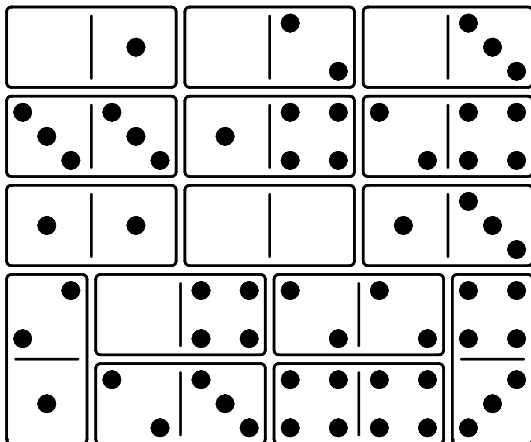
Solution 18

Solution 19

Adding Donimoes Solutions

Here are the solutions to the Adding Donimoes problems. For each step, move the listed domino left, right, up, or down. Adding moves contain the domino numbers, (H)orizontal or (V)ertical direction, and the position to place it. The top left corner is 11, one space to the right is 21, and one space below is 12.

1. 36D, 23V21, 33D, 53V32, 25H21, 36D, 23D, 22H13, 33D, 53D, 22R

Donimoes is an original puzzle designed by Don Kirkby.