

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

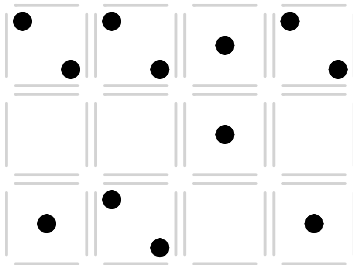
Dominosa

The domino puzzle I most often see in books or online is called either Dominosa or Domino Solitaire. Given a grid of numbers, you have to lay out the dominoes so they match the numbers, without duplicated or missing dominoes. Dominosa was invented by O.S. Adler in 1874. I took a long time to add this puzzle to the collection, because I found it tedious to keep searching for unique numbers. After some research, though, I learned that people have found many other techniques for solving that aren't as tedious. Try to work out your own techniques as you solve these problems, then read my techniques at the end. Let me know if you find any new ones. Even with all those tricks, it's not trivial to solve. (In computer science, it's called [NP-hard].)

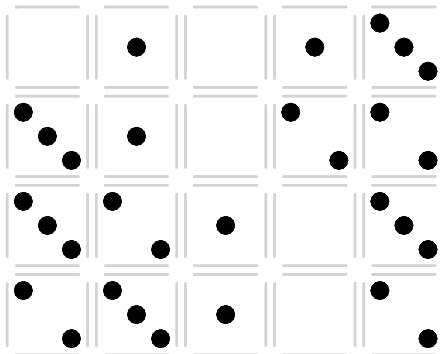
One thing I find interesting about this puzzle is that it's easier to solve with pencil and paper than with a set of dominoes.

If you like this style of puzzle, Reiner Knizia published some puzzles called Domino Knobelspass that are very similar to Dominosa.

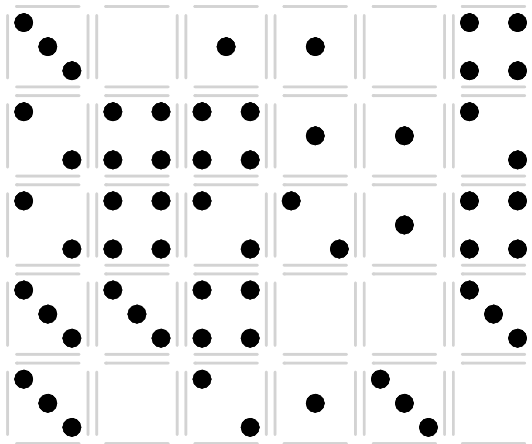
Problem 1



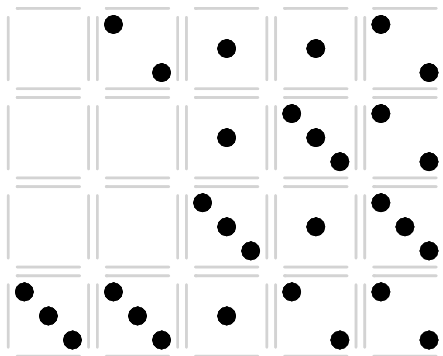
Problem 2



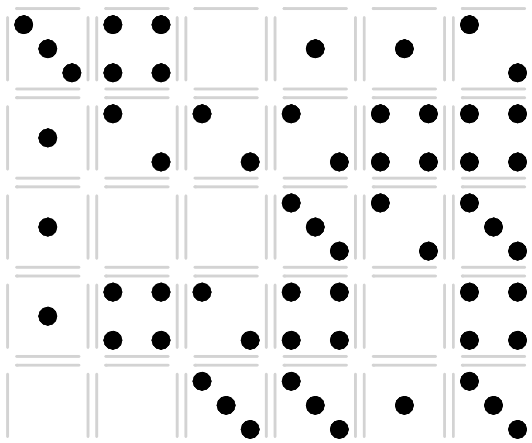
Problem 3



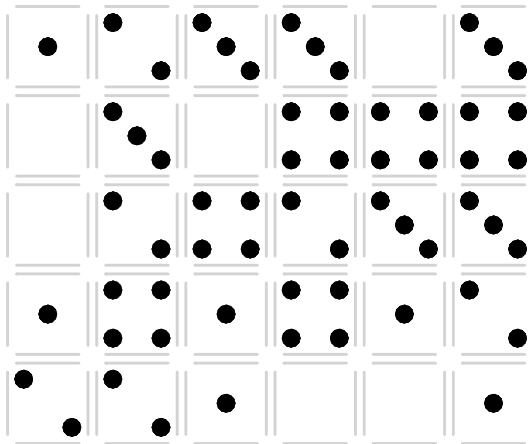
Problem 4



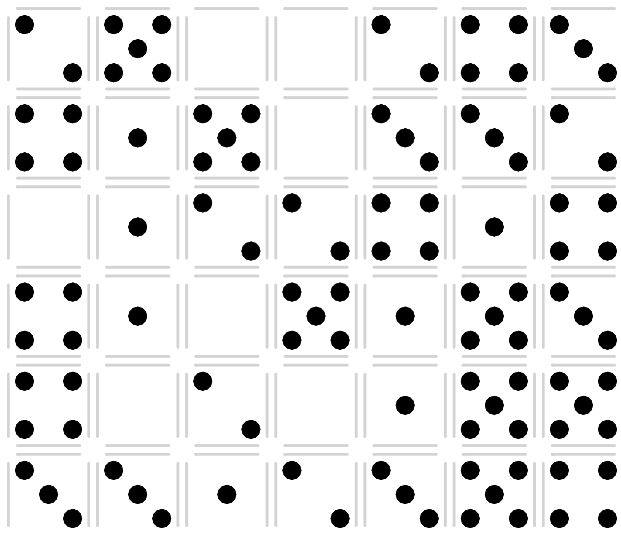
Problem 5



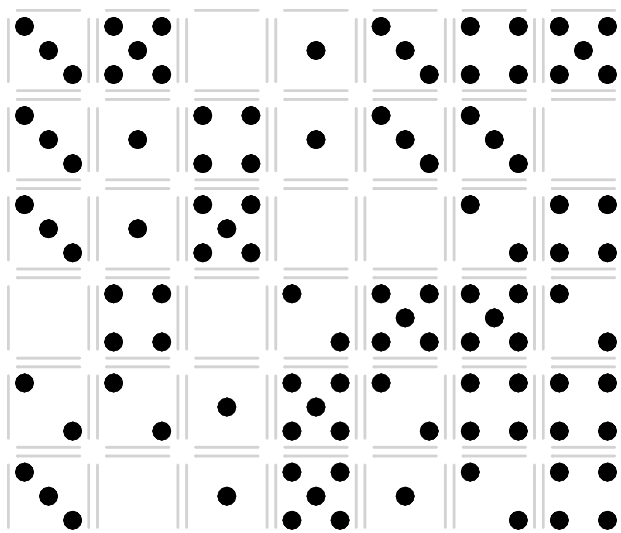
Problem 6



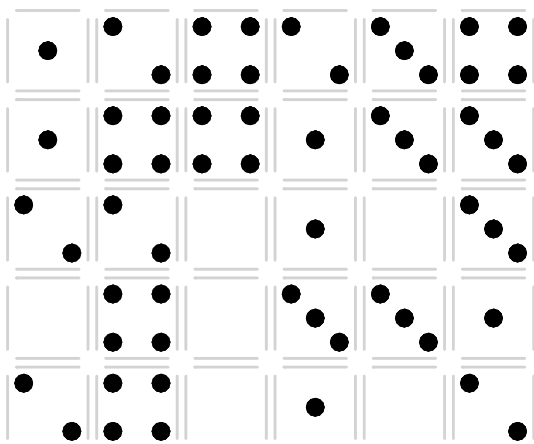
Problem 7



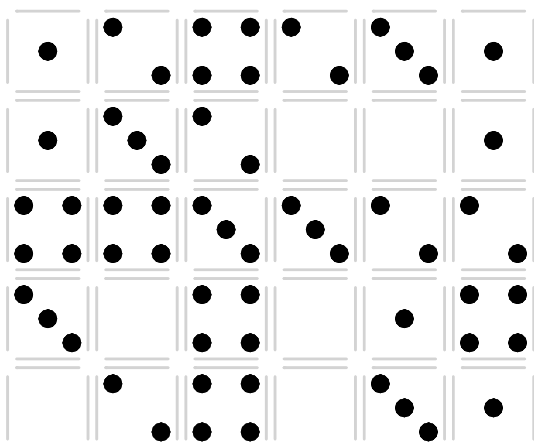
Problem 8



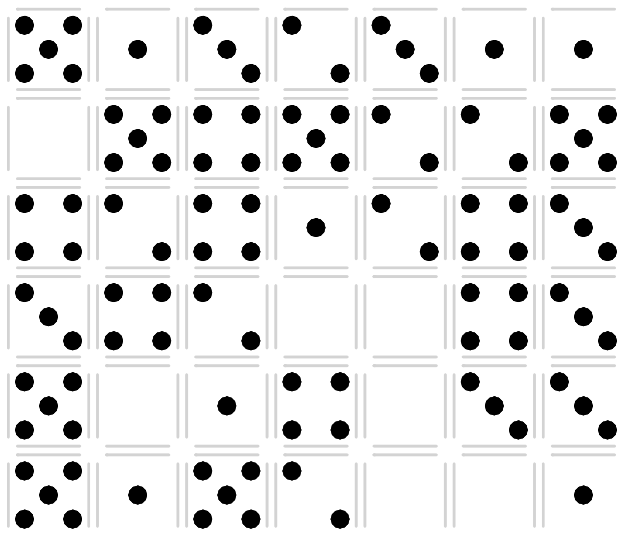
Problem 9



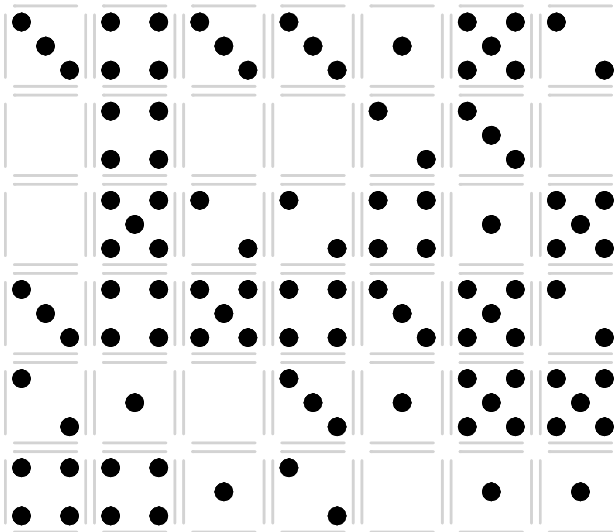
Problem 10



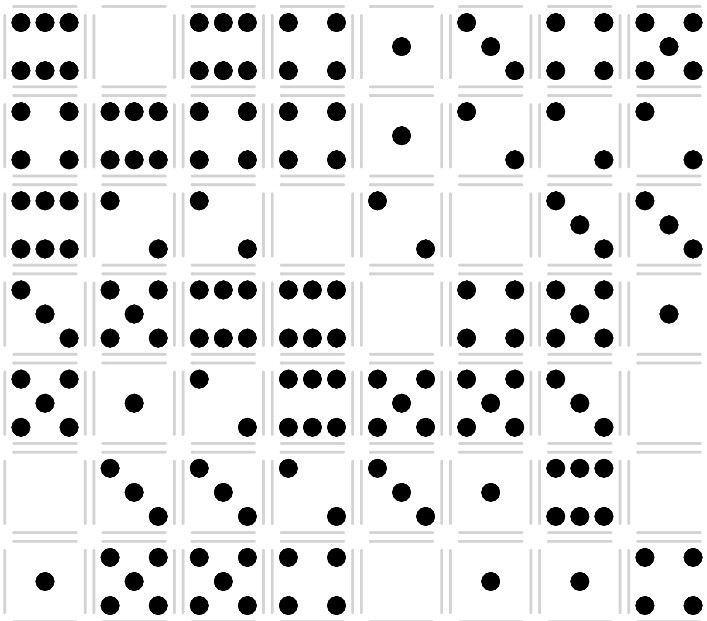
Problem 11



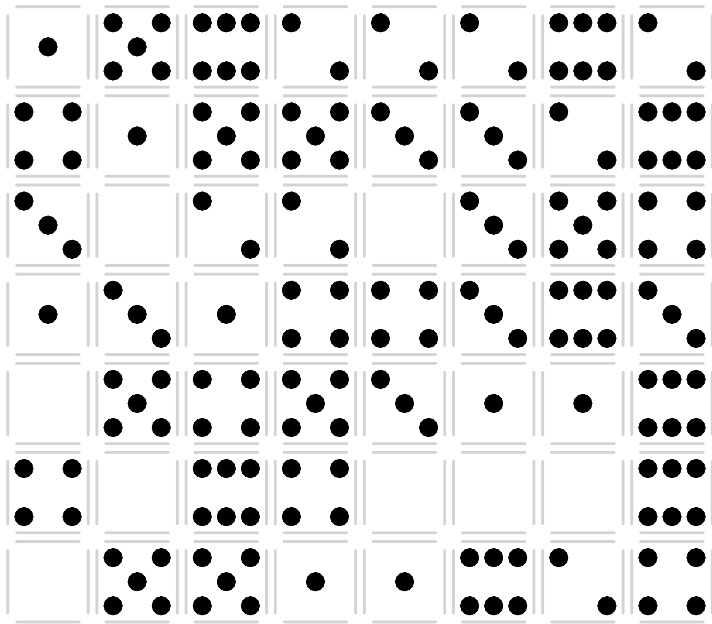
Problem 12



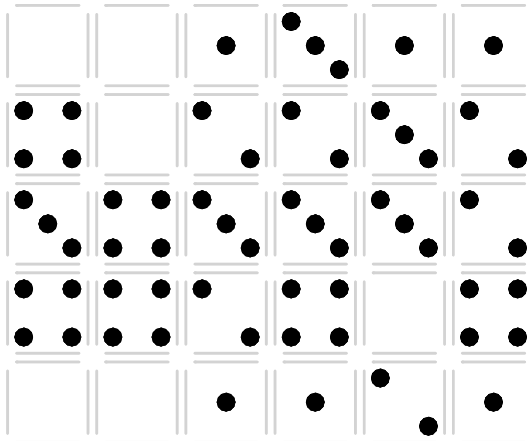
Problem 13



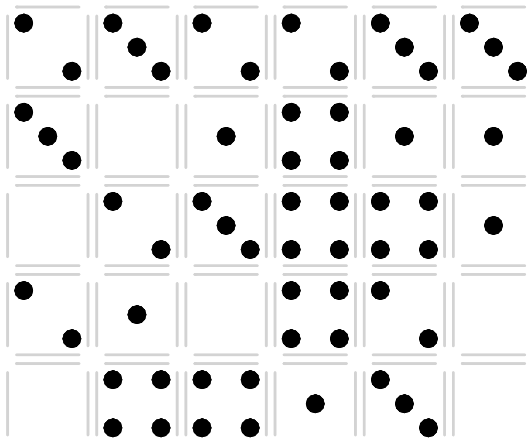
Problem 14



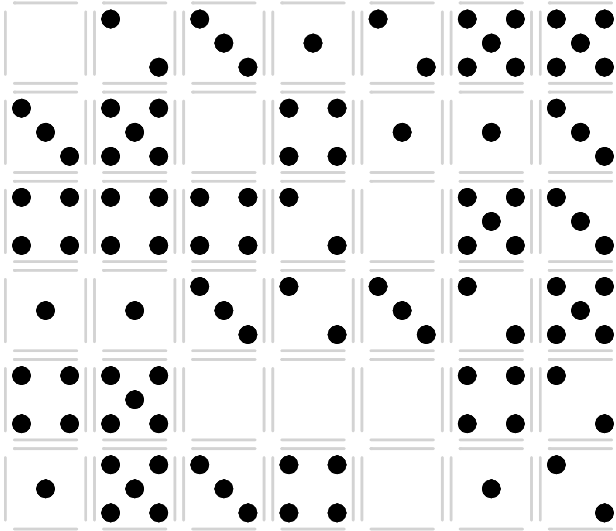
Problem 15



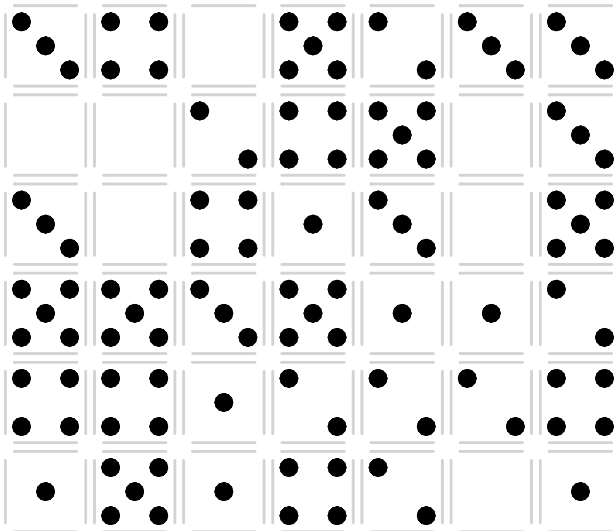
Problem 16



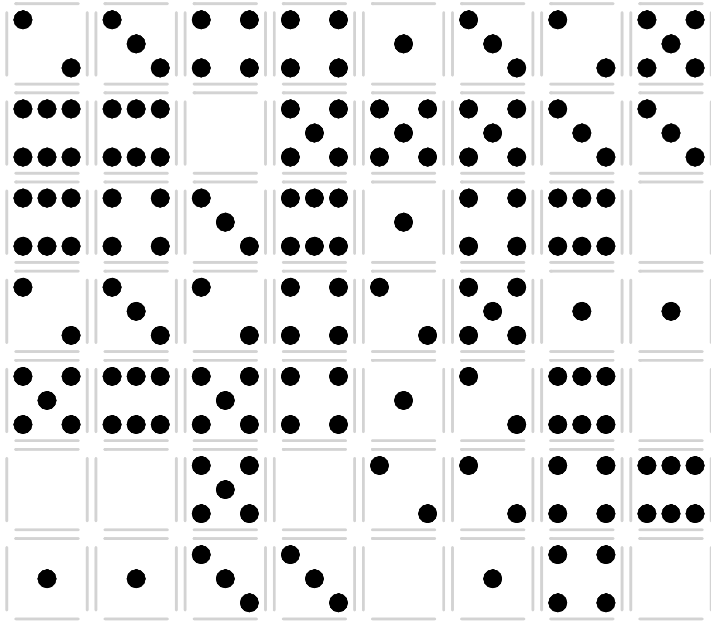
Problem 17



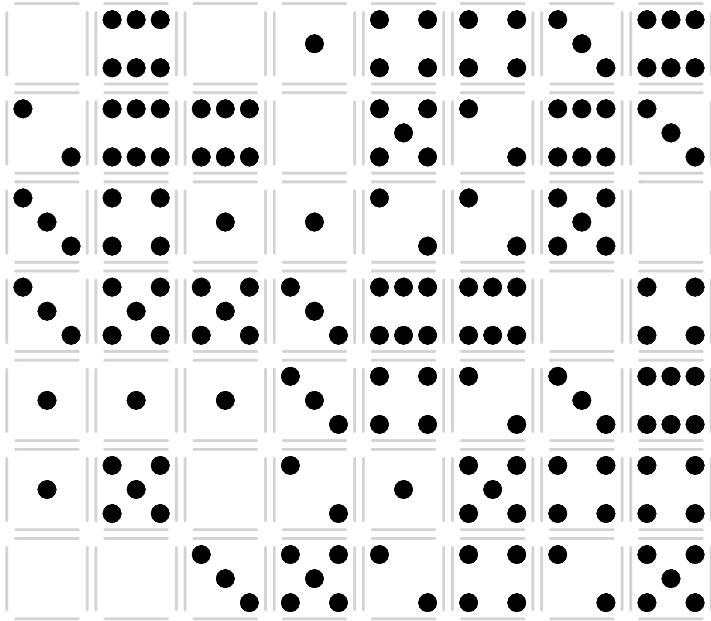
Problem 18



Problem 19



Problem 20



Dominosa Strategy

There are several methods to deduce where the dominoes must be placed, and it's helpful to write notes on the puzzle. Often, you can tell where a domino can't be before you know where it must be. Here are some rules to help you make progress:

1. Look for a number 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 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 a few times 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.

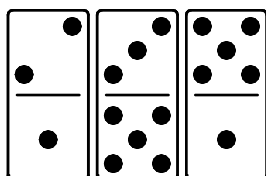
Goal

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.

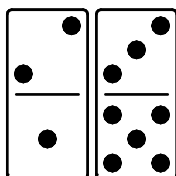
Start

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.

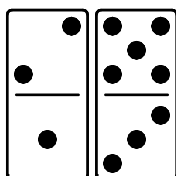
For example, if this is the queue:



Then the start position is like this:



Not like this:



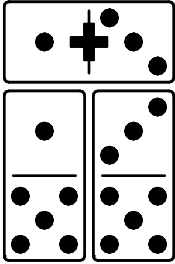
Moves

There are only two ways a domino can move.

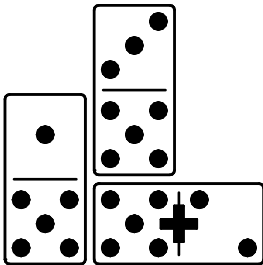
Adding

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.



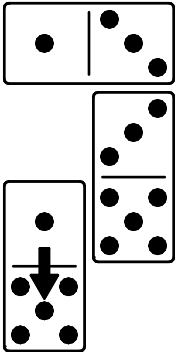
In this example, the 52 can be added, because it matches the 5 beside and the 5 above. The 52 could also be added in the vertical position.



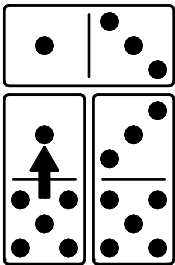
Sliding

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.



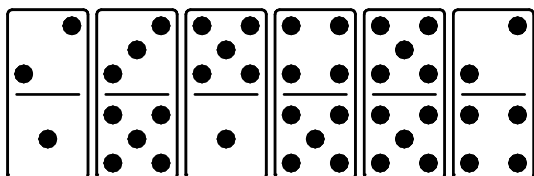
Stay Connected

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.

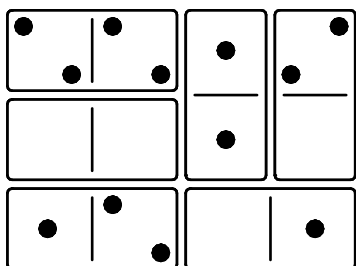
Problem 1



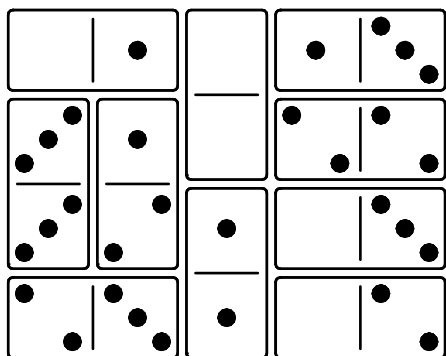
Solutions

Dominosa Solutions

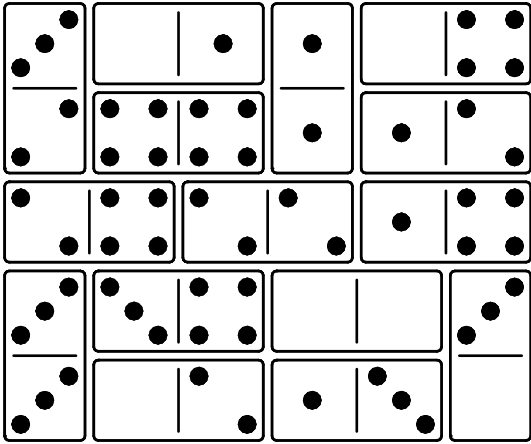
Solution 1



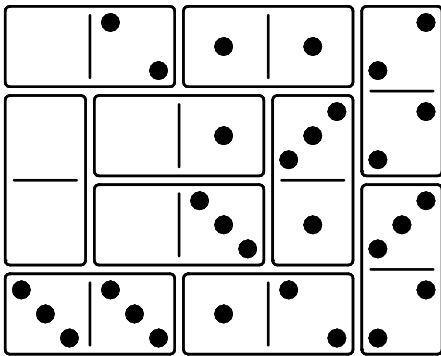
Solution 2



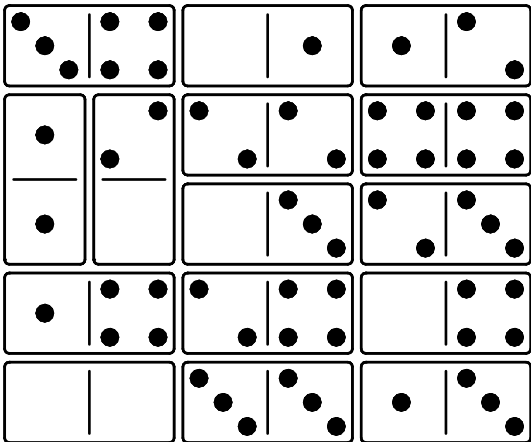
Solution 3



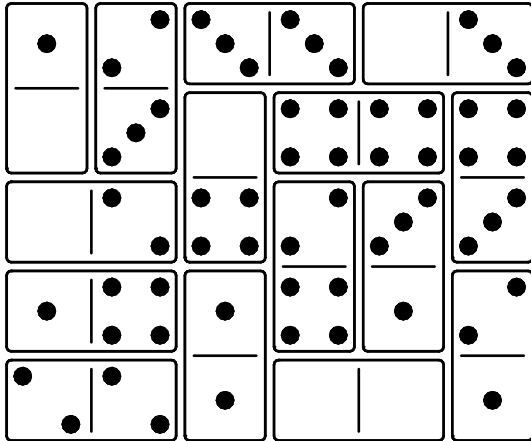
Solution 4



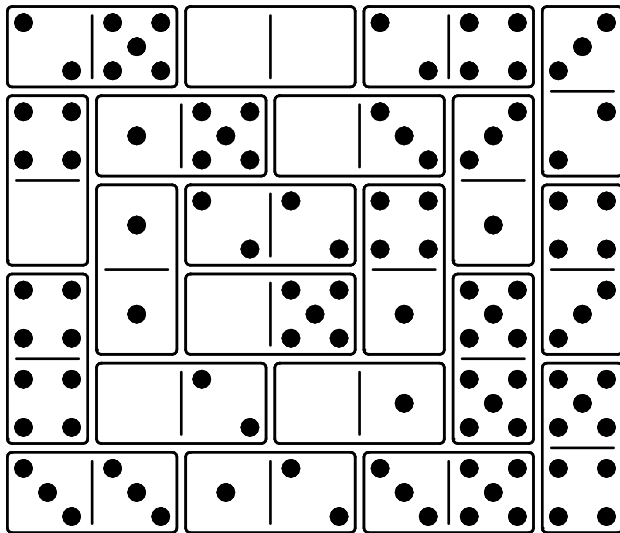
Solution 5



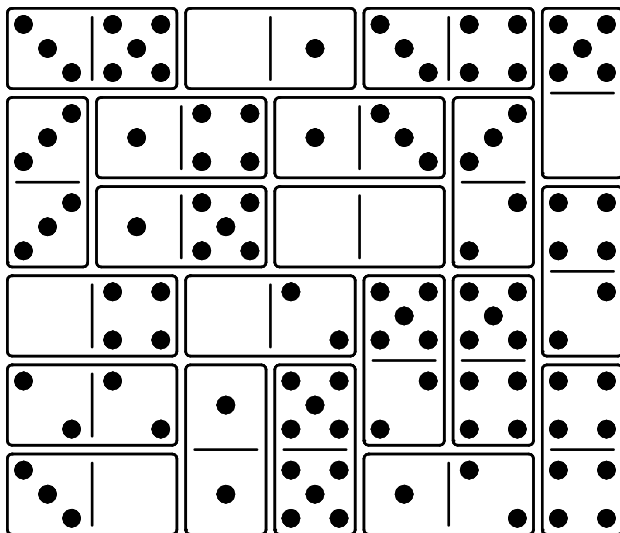
Solution 6



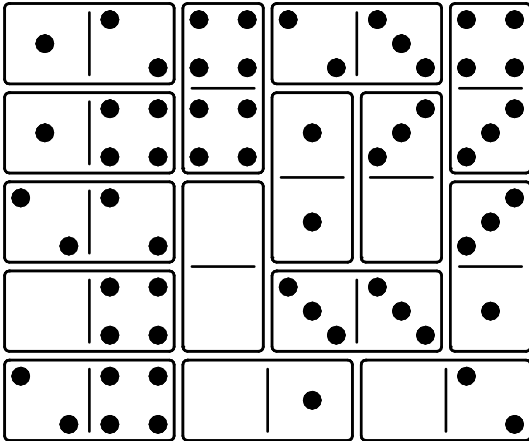
Solution 7



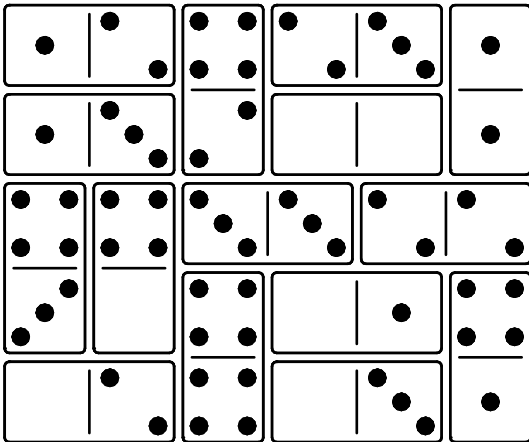
Solution 8



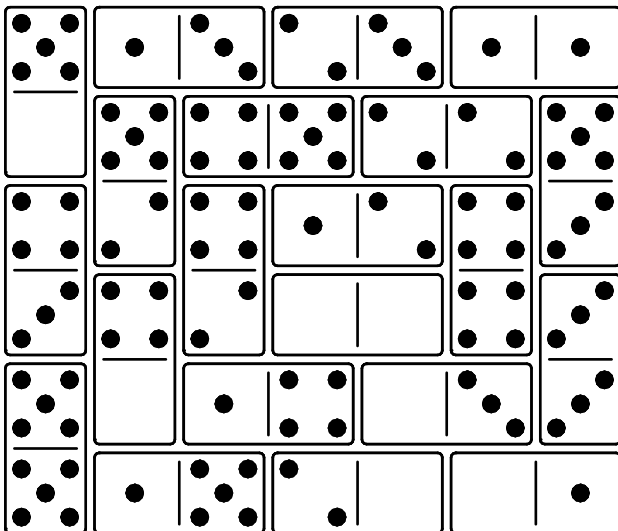
Solution 9



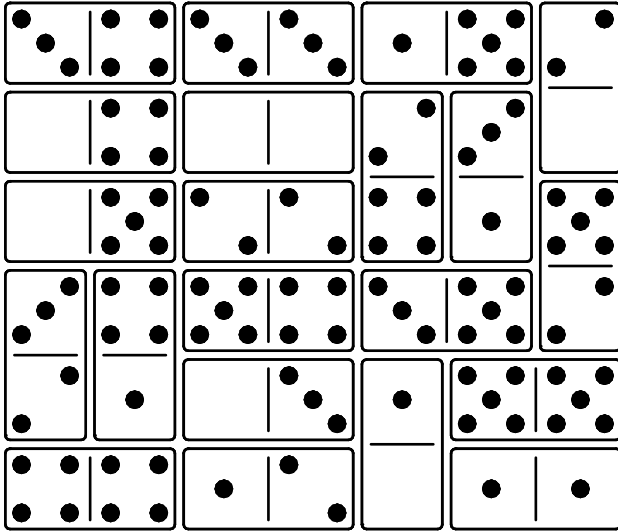
Solution 10



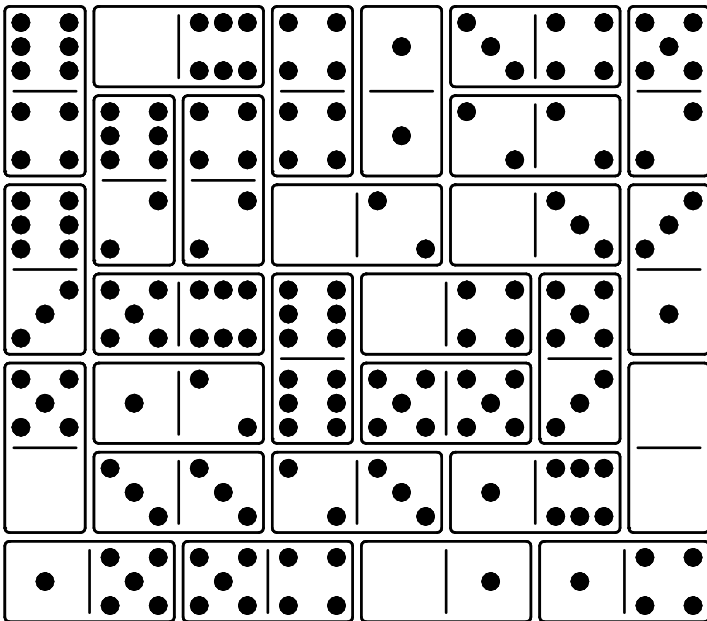
Solution 11



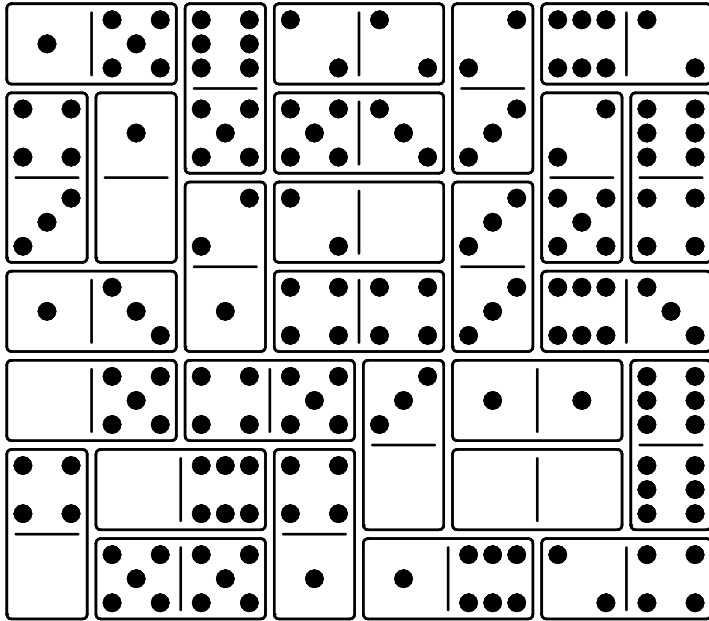
Solution 12



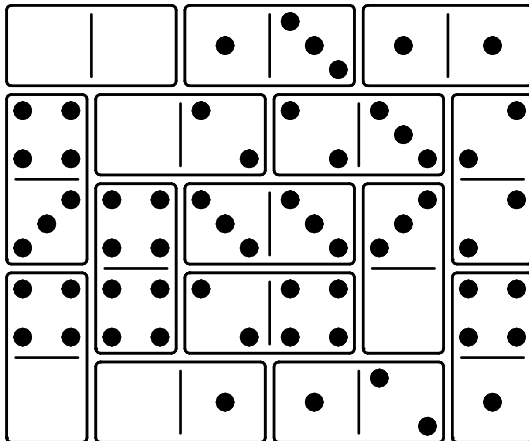
Solution 13



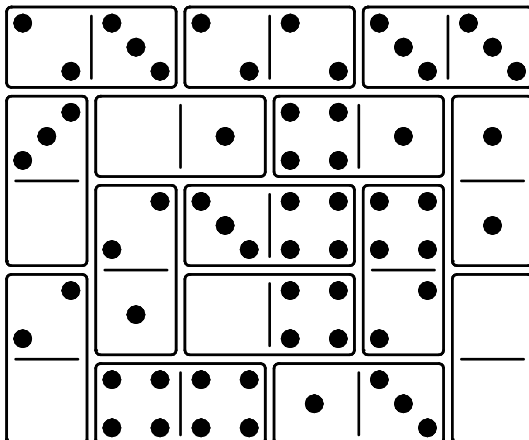
Solution 14



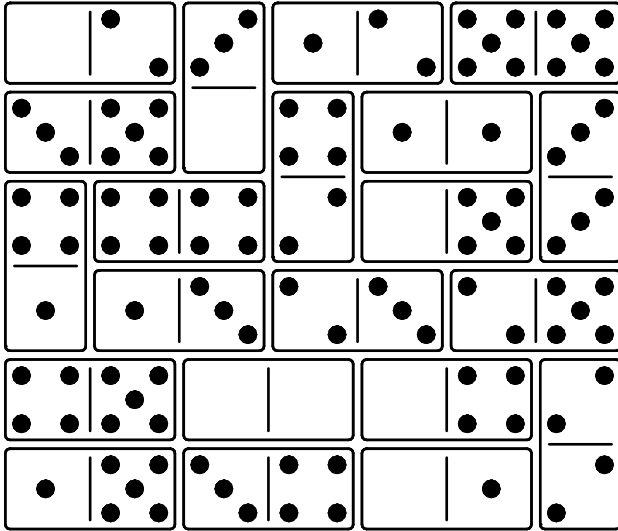
Solution 15



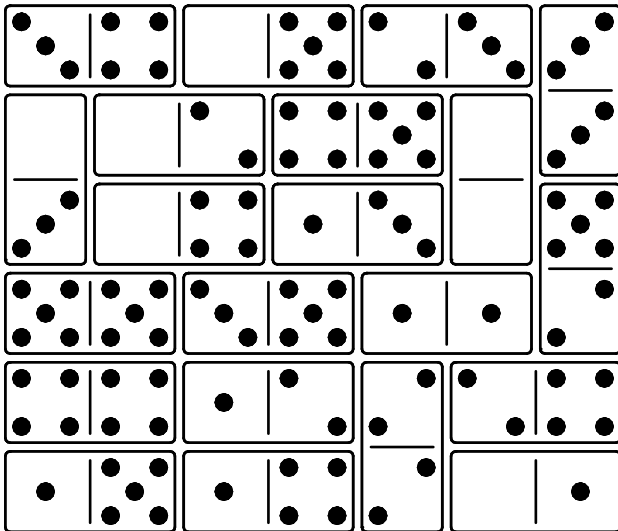
Solution 16



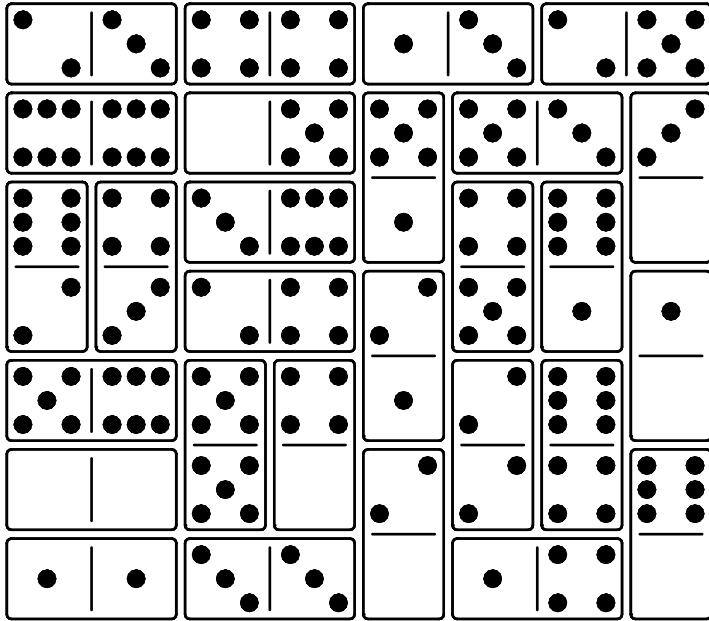
Solution 17



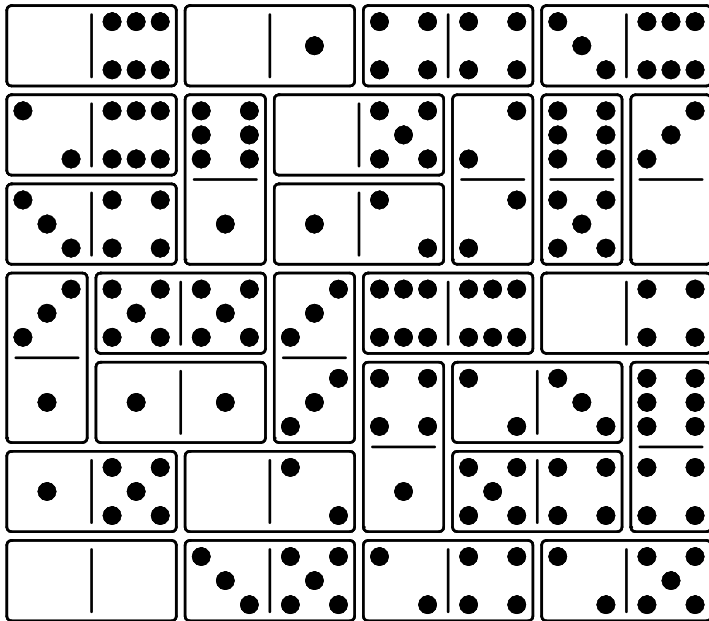
Solution 18



Solution 19



Solution 20



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.

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

Donimoes is an original puzzle designed by Don Kirkby.