Donimoes: Puzzles with Dominoes

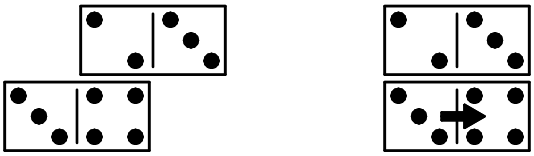
There are two kinds of puzzles: blocking and capturing.

The Blocking Puzzle's Goal

The goal is to slide all the dominoes into a rectangle, without sliding any matching numbers next to each other.

Moves

Move a domino one space along its long axis so that none of its numbers match an adjacent number on a neighbouring domino. In this example, the lower domino can move to the right, because the three doesn't match the two, and the four doesn't match the 3. You couldn't move it another space to the right, because then the threes would be right next to each other.



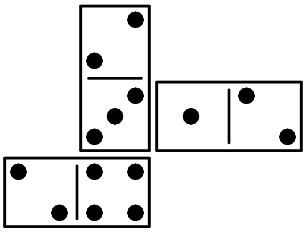
Stay Connected

All the dominoes in the puzzle have to be connected in one solid group, diagonal connections don't count. When you move a domino, it can be disconnected during the move, as long as it is connected at the start and the end of the move. Remember that it can only move one space at a time, though.

Problems

Here are the starting positions for several Blocking Donimoes problems. The solutions are listed at the end.

Problem 1



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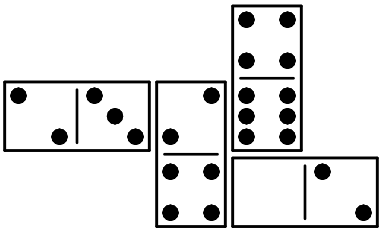
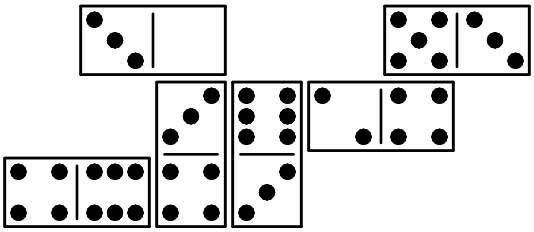


Problem 3



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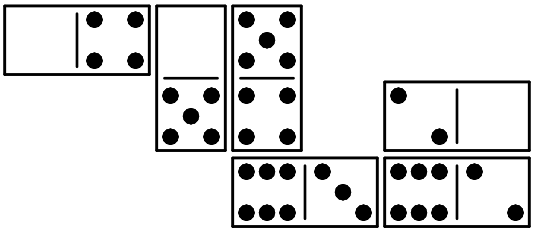

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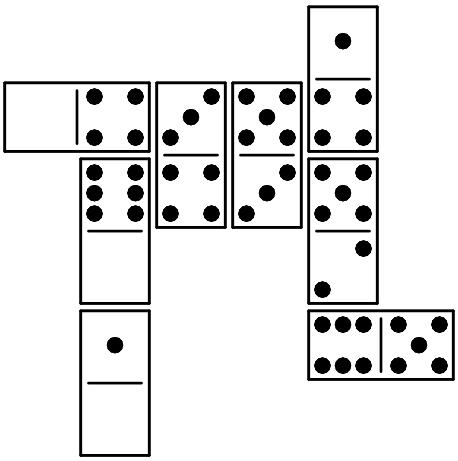

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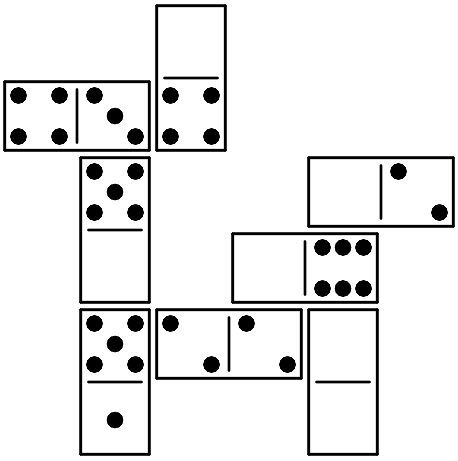

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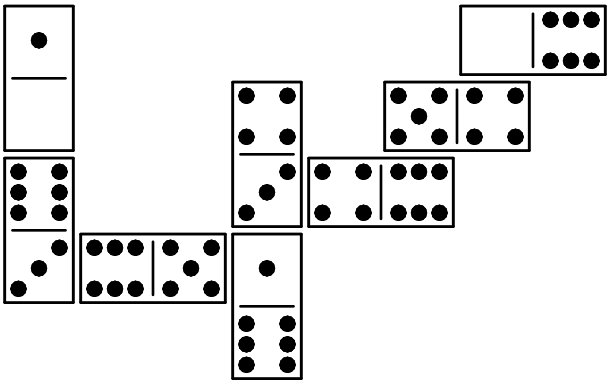

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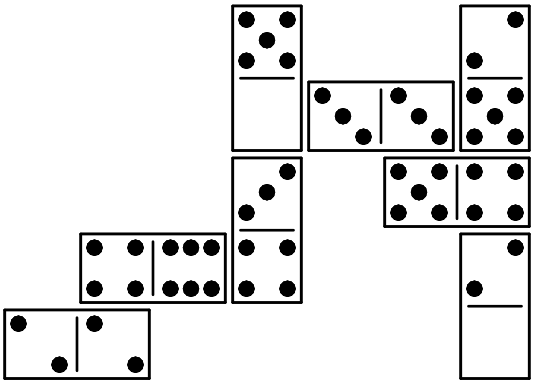

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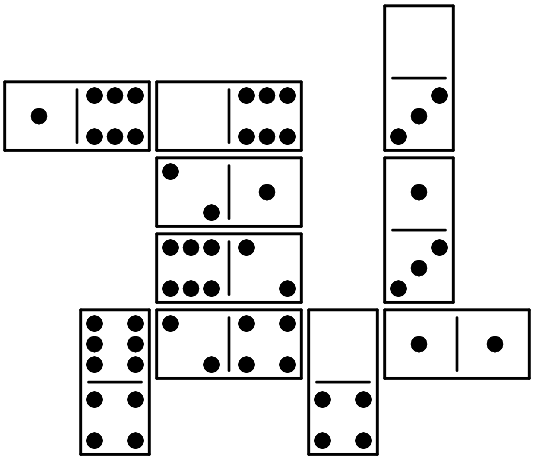

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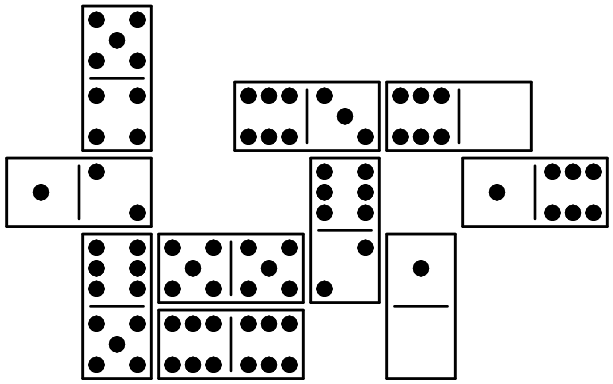

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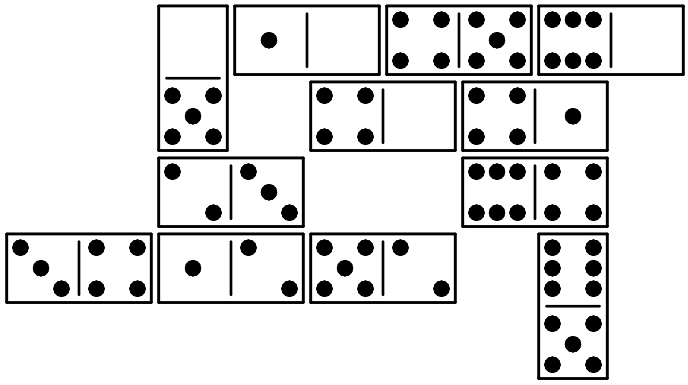

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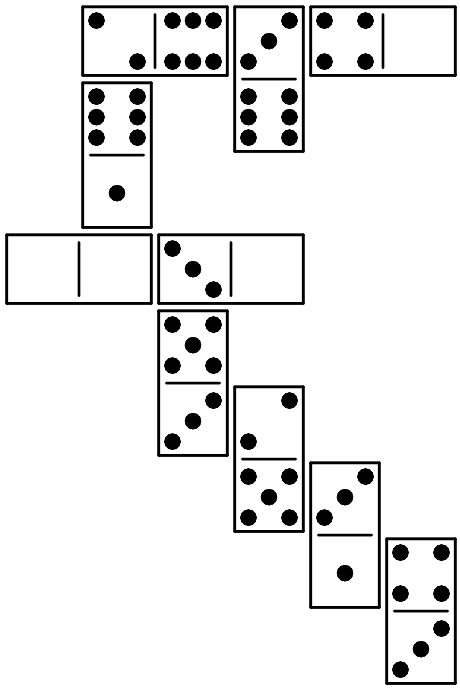

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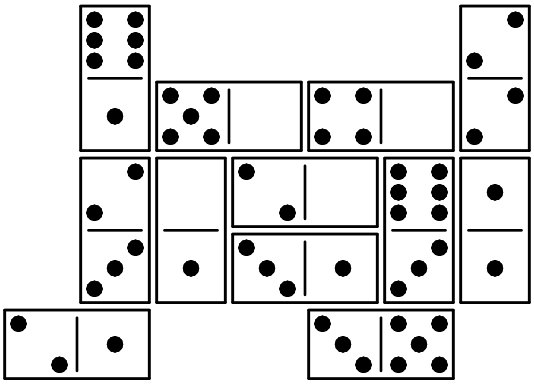
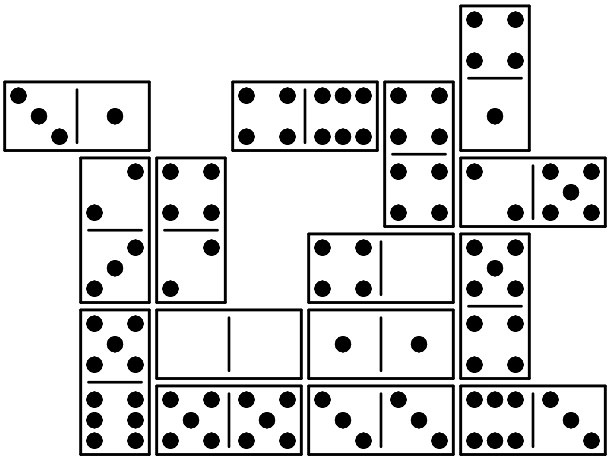


Problem 14



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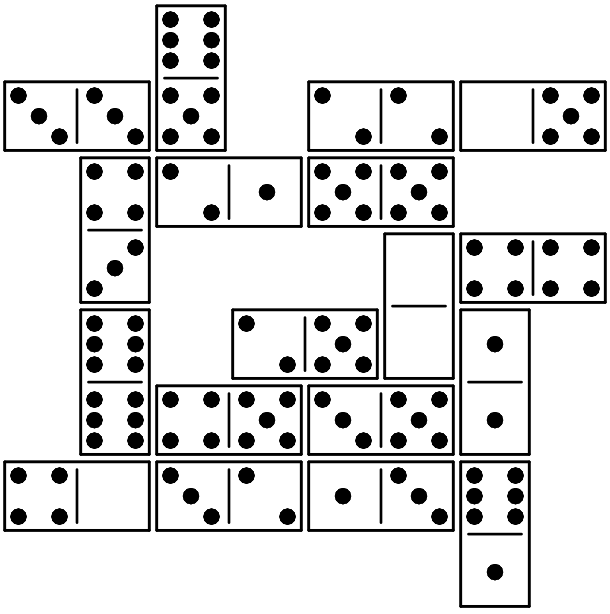

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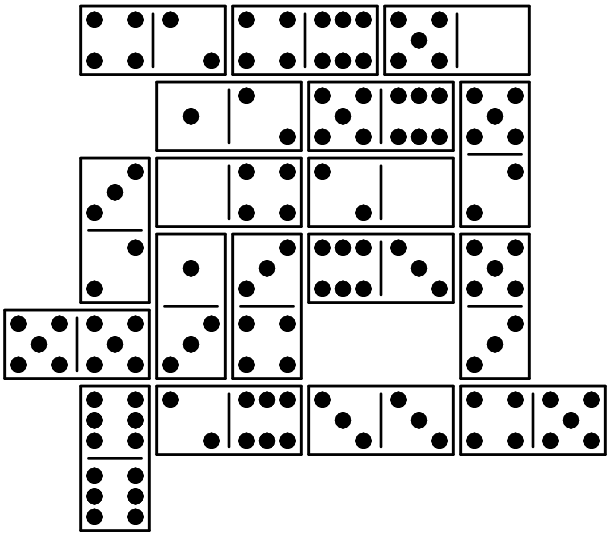

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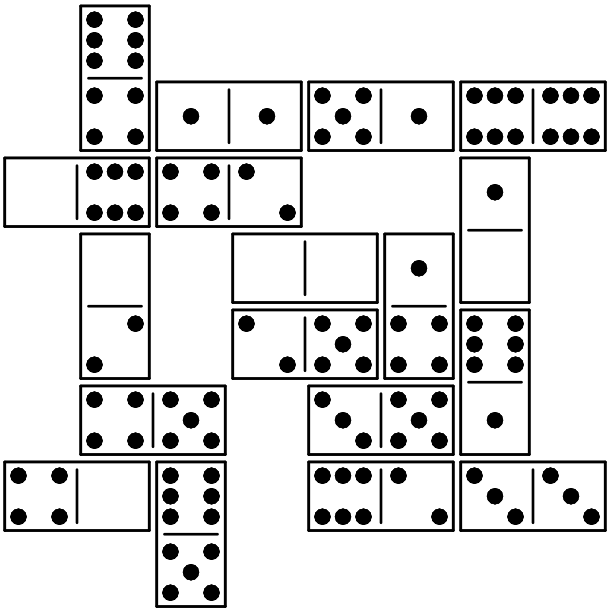

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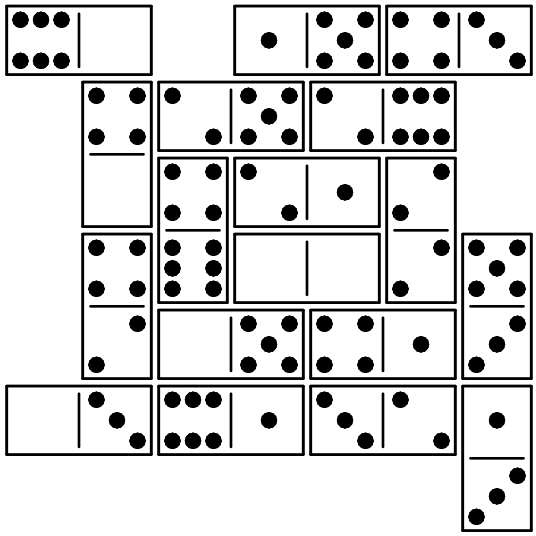

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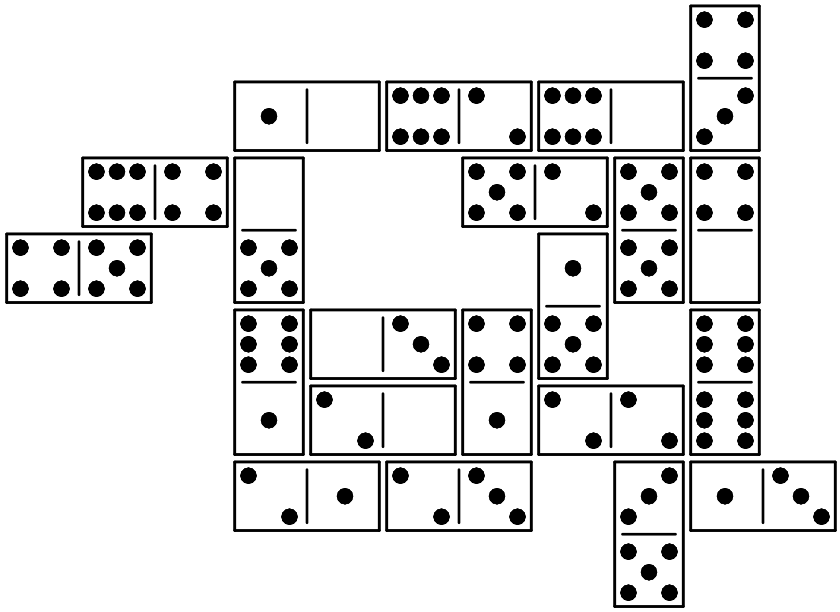
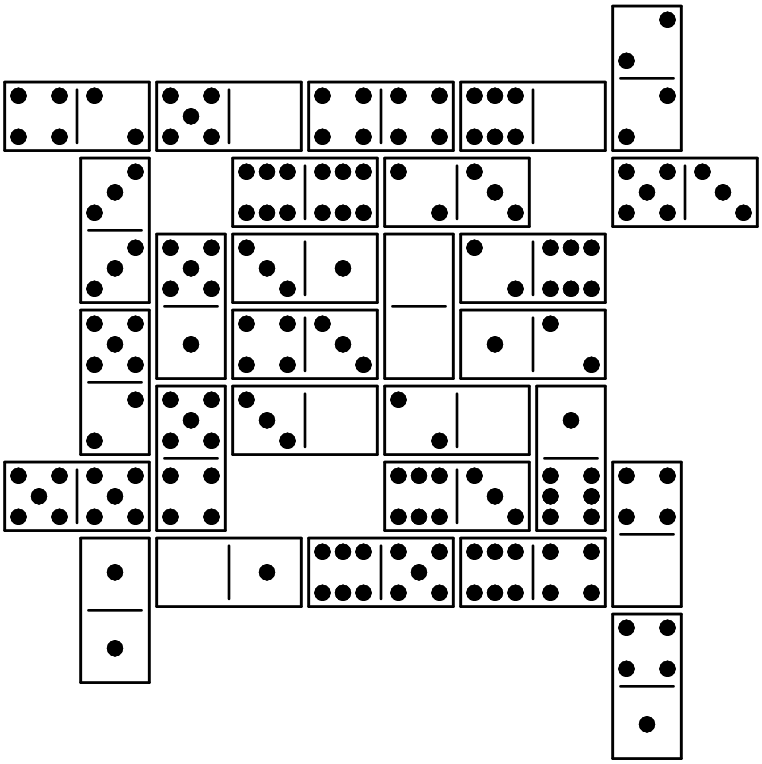


Problem 20



The Capturing Puzzle's Goal

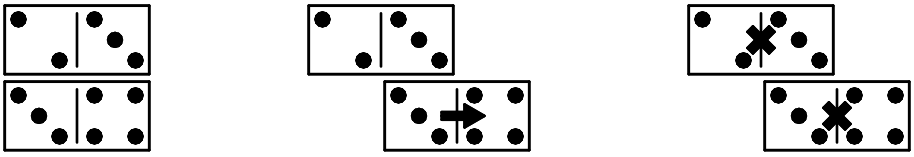
The goal is to collect all the dominoes by sliding matching numbers next to each other.

Moves

There are only two ways a domino can move.

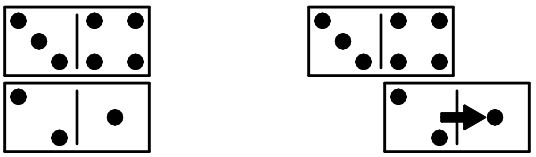
Matching

Move a domino one space along its long axis so that it ends up with at least one of its numbers matching an adjacent number on a neighbouring domino. Then collect the domino you moved and any dominoes that match it, by removing them from the pattern. In this example, the threes match, so you collect both dominoes: solution found!

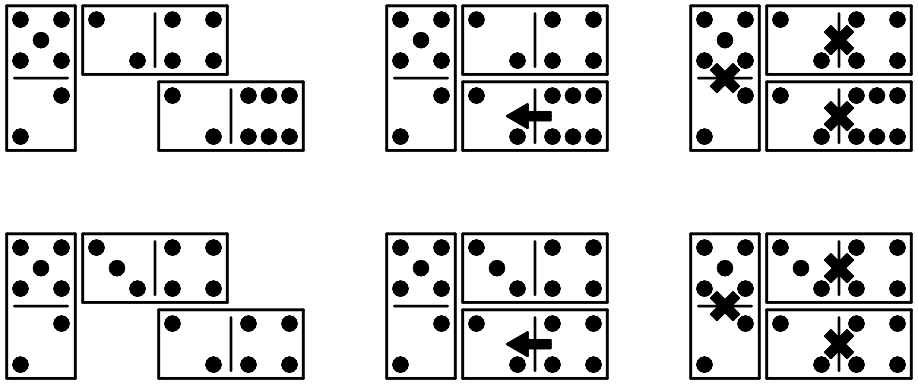


Adding

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. With an adding move, no dominoes are removed. In this example, the two adds up with the four above it to make six.



Sometimes, you can collect more than two dominoes at once. In the first example, the two matches twos on both of the other dominoes, and you collect all three dominoes. In the second example, the two matches the two to the left, and the four matches the four above it. You collect all three dominoes.



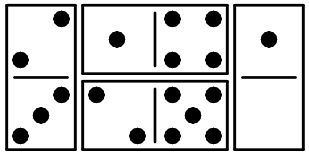
Stay Connected

All the dominoes must stay in one connected group, you can't split the group after moving or after removing the matching dominoes.

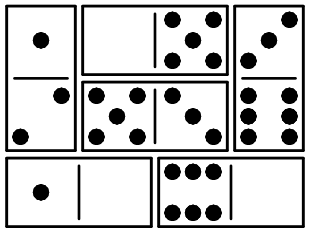
Problems

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

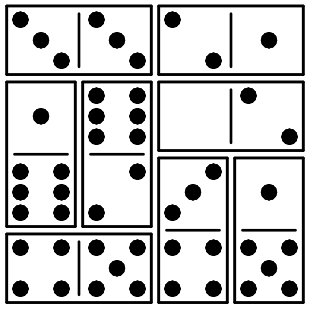
Problem 1



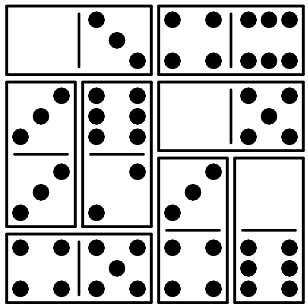
Problem 2



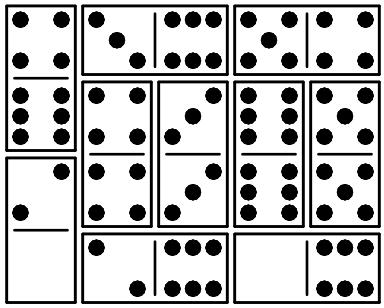
Problem 3



Problem 4



Problem 5



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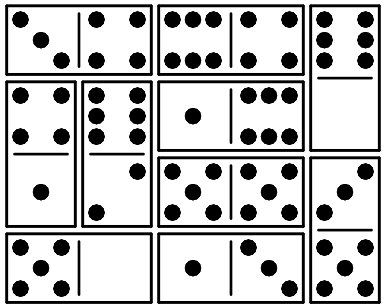

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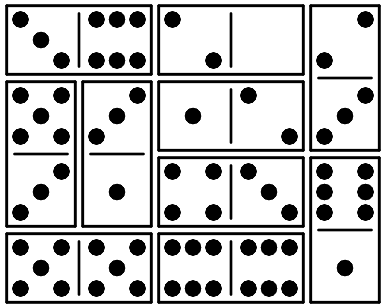

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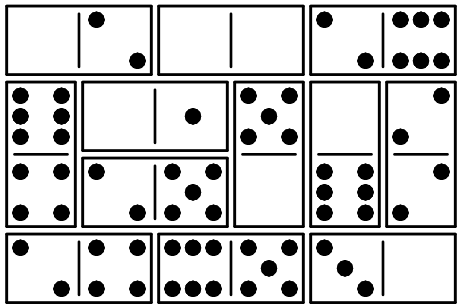
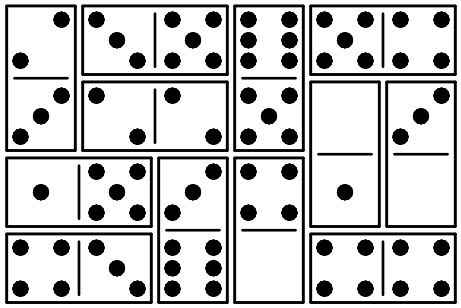


Problem 9



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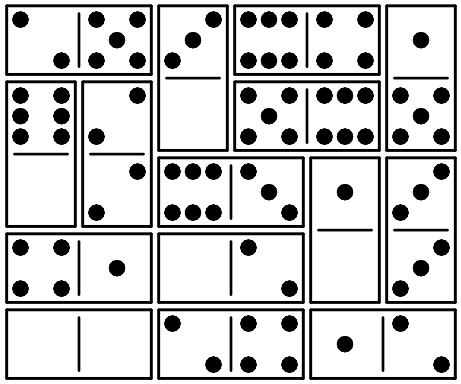
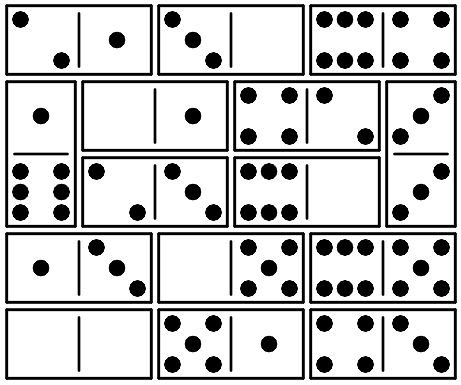
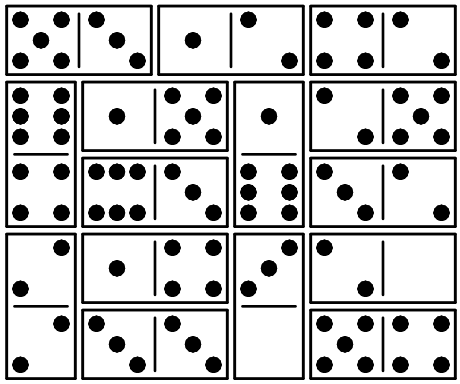


Problem 11



Problem 12



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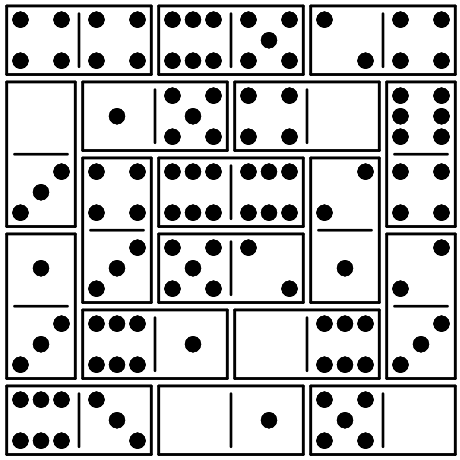

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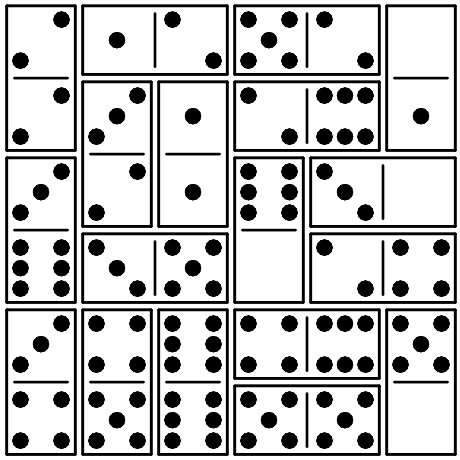

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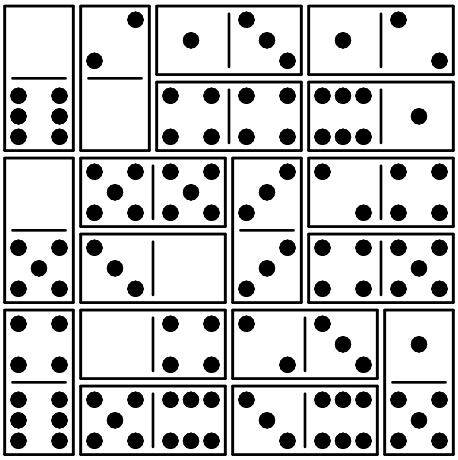

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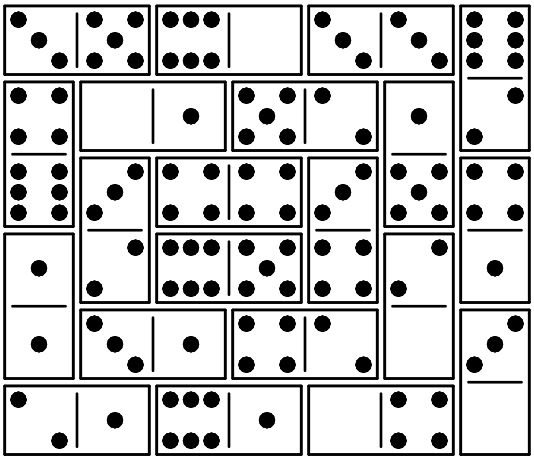

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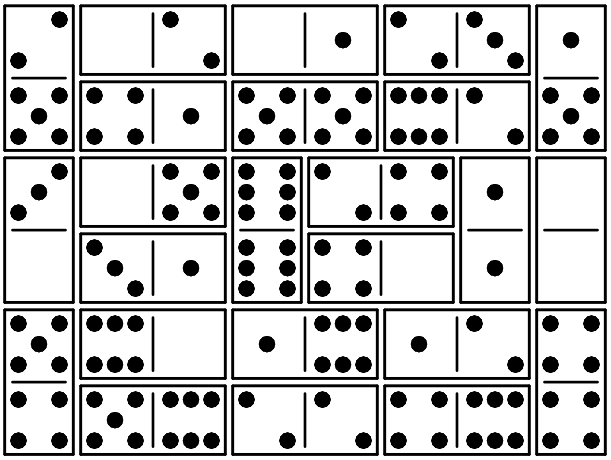

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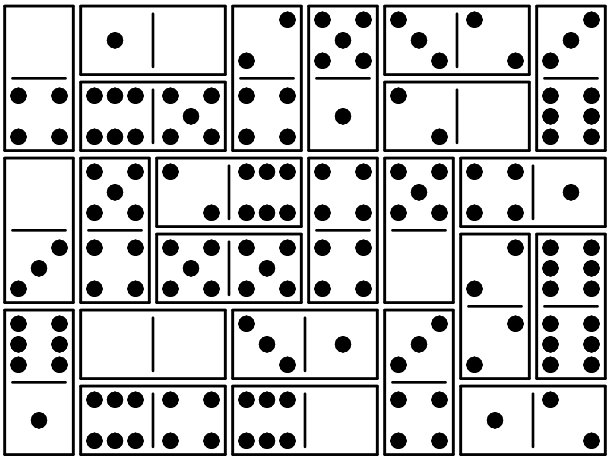

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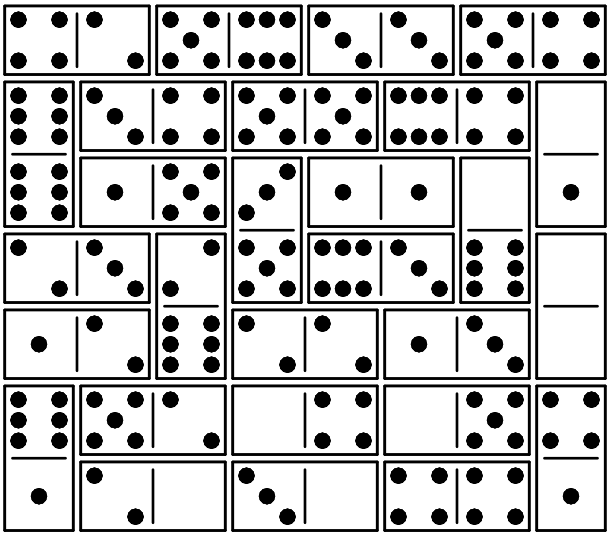

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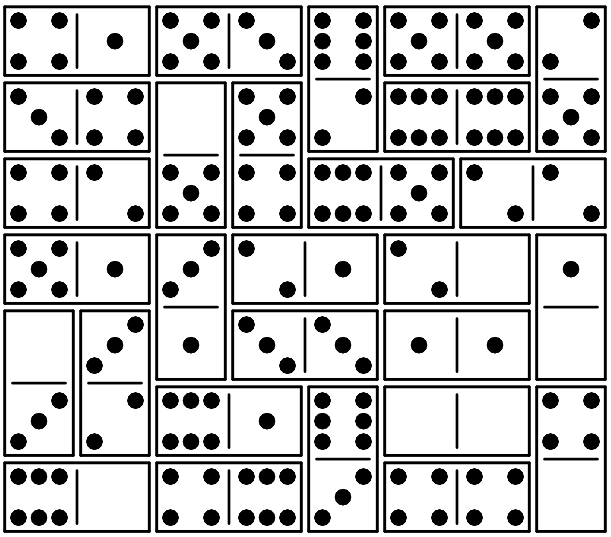


Domino Puzzles By Other Designers

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.

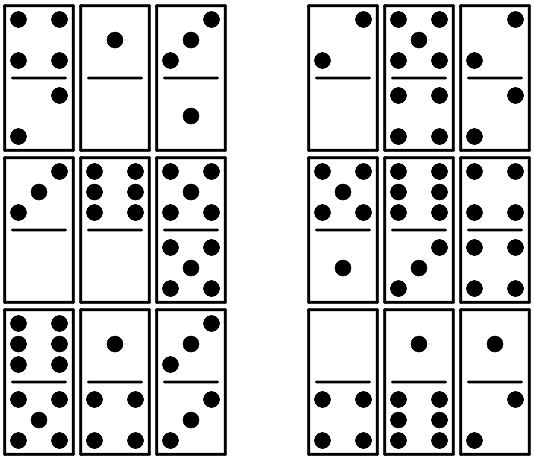
Mountains and Valleys

Sid Sackson included this in his Beyond Solitaire book, and I adapted it from paper, pencil, and dice to use dominoes.

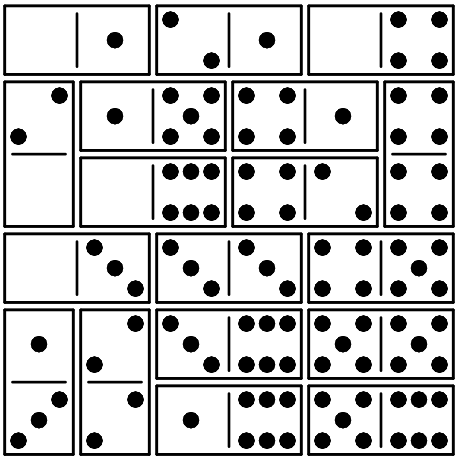
To start, shuffle a set of double-six dominoes face down, then turn 18 of them face up. The remaining 10 aren't used.

Then arrange the dominoes into a 6x6 square of numbers that represents a map of mountains and valleys, where blanks are at sea level, and sixes are the highest peaks. The goal is to make a map where you can walk to every square. You can walk from one square to its neighbour if the two heights are the same or differ by one. (You can't climb cliffs.)

For example, this set of 18 dominoes:



Can be arranged into this solution:



I like this solitaire, because it can almost always be solved, though finding a solution can be very difficult. There's usually more than one solution. For example, you can flip the 56 domino, above. There is a trivially unsolvable situation whenever one of the numbers from 1 to 5 is completely missing, but I haven't found any other unsolvable combinations.

Contributing

Found some interesting problems to solve? Ideas to share? Get in touch at donkirkby.github.com/donimoes.

Blocking Solutions

Here are the solutions to the Blocking Donimoes problems. For each step, move the listed domino left, right, up, or down.

1. 24R, 24R, 23D
2. 24U, 02L, 02L, 02L, 24D, 46D
3. 53L, 53L, 63D, 24L, 34D, 24L, 24L, 24L, 34U, 63U, 30L, 53L
4. 20L, 63L, 62L, 54U, 20L, 63L, 62L, 05U, 20L, 20L, 20L, 05D, 54D, 63L, 62L
5. 65L, 65L, 52D, 14D, 53D, 34D, 04R, 04R, 60U, 10U
6. 04D, 04D, 43R, 43R, 43R, 04U, 50U, 06L, 51U, 02L, 00U
7. 06L, 54L, 06L, 06L, 06L, 06L, 43U, 46L, 43U, 54L, 46L, 46L, 16U, 54L, 54L, 43D
8. 22R, 22R, 22R, 22R, 34D, 50D, 54L, 25D, 50U, 54L, 54L, 34D, 46R, 54R, 54R, 50D, 46R, 46R, 34U
9. 21L, 06R, 16R, 21R, 62R, 64U, 64U, 24L, 62L, 04U, 04U, 11L, 11L, 13D, 03D
10. 43U, 31U, 43U, 31U, 43U, 31U, 43U, 31U, 43U, 31U, 43U, 25U, 30R, 53U, 30R, 25U, 53U, 53U, 00R, 25U
11. 23L, 52R, 12R, 34R, 23R, 23R, 05D, 10L, 40L, 45L, 60L, 41L, 64L, 65U, 65U, 52R, 12R, 34R
12. 12R, 66R, 10D, 16L, 63L, 12R, 54D, 63R, 16R, 10U, 66L, 62D, 10D, 16L, 12R, 63L, 60L, 12L, 16L, 10U
13. 11D, 22D, 11D, 22D, 40R, 40R, 63U, 63U, 20R, 50R, 01U, 21R, 21R, 01D, 50L, 23D, 61D, 20L, 63D, 63D, 40L, 40L, 22U, 11U
14. 31R, 40L, 44D, 46R, 31R, 23U, 56U, 55L, 55L, 33L, 33L, 63L, 63L, 54D, 54D, 11R, 11R, 44D, 25L, 25L, 41D, 25L, 44U, 11L, 11L, 54U, 54U, 63R, 33R, 55R
15. 55R, 21R, 65D, 65D, 33R, 33R, 43U, 66U, 45L, 25L, 35L, 00D, 44L, 44L, 44L, 11U, 61U, 00U, 35R, 25R, 45R, 66D, 65D, 21L, 55L, 11U, 61U, 13R, 32R, 40R, 43D, 33L, 22L, 05L
16. 32U, 42L, 46L, 32D, 12L, 56L, 50L, 52U, 52U, 20R, 20R, 04R, 04R, 34U, 13U, 55R, 55R, 66U, 55R, 13D, 55R, 34D, 04L, 20L, 52D, 04L, 20L, 52D, 50R, 56R, 12R, 32U, 66U, 26L, 33L, 45L, 46R, 42R
17. 45R, 42R, 02D, 42R, 06R, 06R, 64D, 64D, 11L, 51L, 66L, 11L, 51L, 66L, 10U, 10U, 42R, 42R, 61U, 14U, 35R, 25R, 45R, 65U, 65U, 65U, 40R, 45L, 25L, 14D, 35L, 42L, 61D, 42L, 62L, 33L, 10D, 10D, 66R, 51R, 11R
18. 60R, 53U, 53U, 43R, 15R, 60R, 40U, 40U, 25L, 25L, 46U, 42U, 05L, 41L, 13U, 13U, 41R, 05R, 42D, 46D, 32R, 61R, 03R, 25R, 25R, 40D, 40D, 60L, 15L, 43L
19. 41U, 22L, 35U, 35U, 13L, 13L, 66D, 40D, 43D, 66D, 40D, 43D, 60R, 60R, 55U, 55U, 52R, 62R, 10R, 05U, 45R, 61U, 05U, 64R, 61D, 45R, 64R, 64R, 45R, 05D, 45R, 05D, 10L, 62L, 52L, 55D, 55D, 60L, 60L, 43U, 40U, 66U
20. 53L, 66L, 23L, 53L, 22D, 22D, 60R, 44R, 50R, 60R, 42R, 44R, 50R, 42R, 33U, 33U, 66L, 66L, 51U, 52U, 54U, 55R, 55R, 11U, 11U, 01L, 65L, 63L, 64L, 16D, 20R, 16D, 40U, 41U, 16U, 20L, 40U, 41U, 16U, 64R, 63R, 65R, 55R, 54D, 01R, 11D, 52D, 51D, 66R, 66R, 33D, 33D, 42L, 50L, 44L, 60L

Capturing Solutions

Here are the solutions to Capturing Donimoes problems. For each step, move the listed domino left, right, up, or down. Then make captures for any matching numbers.

1. 10D, 14R, 23D, 14R
2. 60R, 10R, 12D, 12D, 53R
3. 21R, 34U, 45R, 34U, 16U
4. 03L, 46L, 05R, 34U, 45R, 46L, 45R
5. 54R, 20D, 46D, 06L, 36R
6. 34L, 64L, 55L, 35D, 50R, 60D

7. 61D, 43R, 55R, 53D, 53D, 20R, 36R
8. 26R, 24L, 65L, 01L, 30L, 06U, 30L
9. 40D, 65D, 54L, 01D, 36D, 15R, 23D
10. 30U, 56L, 30D, 10U, 10U, 63R, 30D, 41R, 60D, 25R, 41R, 41R
11. 21L, 23L, 60L, 05L, 65L, 33D, 42R, 42R, 01R, 30L, 60R
12. 30D, 54L, 20L, 54L, 54L, 20L, 20L, 64D, 25R, 15L, 15L, 12R
13. 63L, 01L, 50L, 50L, 21D, 66R, 64D, 40R, 40R, 15R, 43U
14. 50D, 45D, 36D, 22D, 66U, 46R, 46R, 60D, 30L, 01D, 01D, 26R, 12R
15. 12R, 44R, 44R, 33U, 20U, 05U, 46U, 56L, 56L, 30L, 45L, 15U, 36R, 15U
16. 21L, 61L, 04L, 04L, 20D, 15D, 52R, 01R, 32U, 46D, 65L, 41U, 34U, 01R, 35R
17. 54D, 60L, 60L, 25D, 02L, 02L, 01L, 01L, 55L, 62L, 11U, 11U, 40R, 44U, 46R, 22R, 46R, 22R, 16L
18. 61D, 60L, 60L, 31L, 31L, 03D, 04D, 10L, 54D, 26L, 10L, 26L, 24D, 51D, 51D, 41L, 36D, 41R, 34U, 34U, 12L, 20R, 34U
19. 41D, 30R, 12L, 61U, 61U, 20R, 26D, 13L, 34L, 06D, 34L, 55L, 35U, 35U, 11R, 64R
20. 25U, 40D, 10D, 63D, 60R, 60R, 32D, 20R, 31D, 65R, 62D, 21R, 51R, 34L, 53R, 51R

Donimoes is an original puzzle designed by Don Kirkby.