Instructions for the qualification tournament for the Logic Masters 2015

Welcome to the qualification round for the Logic Masters 2015. We hope that you will enjoy the competition, regardless of whether you compete seriously or just for fun.

The contest will start on Friday, February 27 at 12:00 pm and end on Monday, March 2 at 12:00 pm CET.

During that time, you can choose to start solving whenever you want. When you do, you will obtain the password for the encrypted contest file; after that, you have 150 minutes to solve the puzzles and send your answers via the contest page. Note that no results will be accepted on Monday after 12:00 pm anymore.

Rules and rule changes

- Wrong answers will yield a penalty of 5 points. During your solving time you can correct any mistakes, of course.

- Incorrect answer keys for an otherwise correct solution may be accepted as correct. However, in such a case only 80% of the puzzle's points will be given.

- You may enter your answer keys at any time, to avoid time trouble at the end of the contest.

- You are solely responsible for sending your answers in time.

- You must solve the qualification puzzles without outside help. Computer programs, Sudoku solvers or similar are not allowed.

If there are any last minute changes or clarifications, they will be announced in our forum at
`http://forum.logic-masters.de/showthread.php?tid=1315`.

Answer keys

Please keep in mind the following guidelines when entering your answer keys.

- If not specified differently, enter your solution from top to bottom.

- For clarity's sake, you may use commas and spaces in your answer keys; they have no bearing on the correctness of your solutions.

- The solution form does not distinguish between capital and lower case letters.

Puzzle booklet

The encrypted puzzle file contains the puzzles with instructions and point values, but without examples. There is no cover page.

The puzzles were created by Silke Berendes and Robert Vollmert.

For details on the qualification criteria, and for an overview table of the puzzles, we refer to the German instruction booklet.

Instructions

The following instructions come directly from the contest file; only the diagrams have been removed. Instead of them, small examples are shown. These examples can not be found in the contest file. You should read and understand the instructions and examples before the contest.

1&2. Arukone   5&5 points

Connect each pair of equal numbers with a line that goes horizontally and vertically from cell to cell. It is not necessary to use every cell.

Example
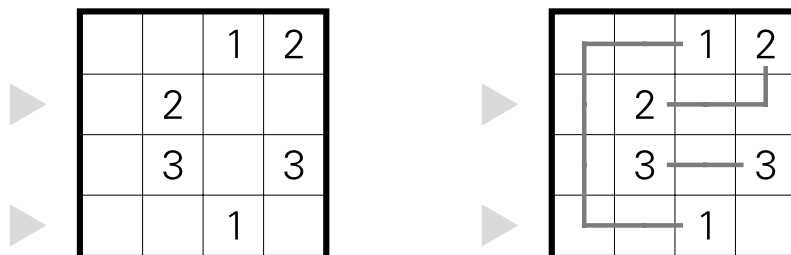
Solution code The marked rows. Use the last digit for two-digit numbers, '-' for blank cells.
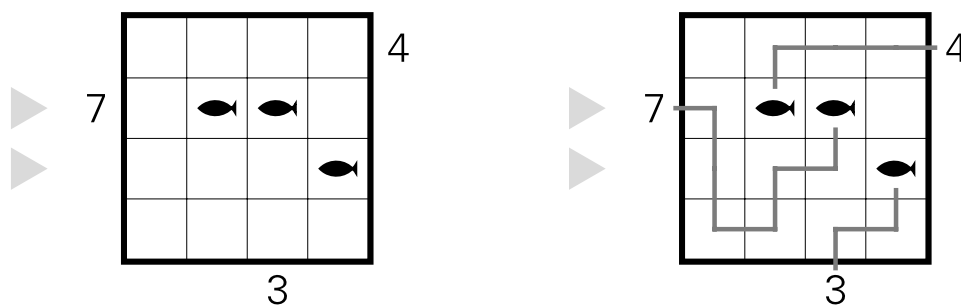
The solution code for the example is `1222,111-`

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3. Angler (Anglers)   10 points

The numbers outside the grid are anglers. Each angler is connected to a fish by a line that goes horizontally and vertically from cell to cell. The given numbers indicate the number of cells visited by the line, including the cell with the fish. Each cell may be used by at most one line. Some cells may remain empty.

Example

Solution code The marked rows. Use 'L' for corners, 'I' for straights, 'F' for fish and '-' for empty cells.
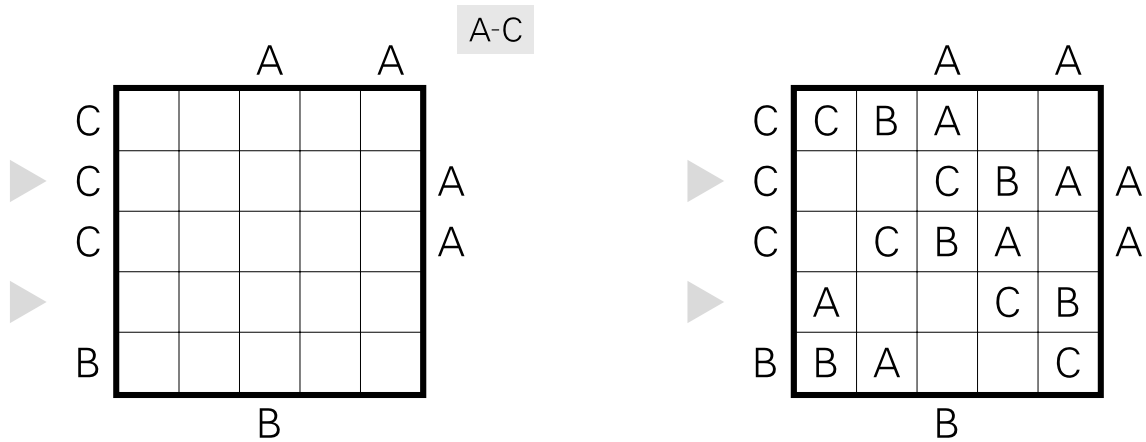
The solution code for the example is `LFF-,ILLF`

4. Buchstabensalat (Easy as ABC) 20 points

Fill the grid with letters from A to D *(A to C for the example)*, such that each row and each column contains each letter exactly once. The letters outside the grid indicate the first letter within that row or column, as seen from that point.

Example

A-C

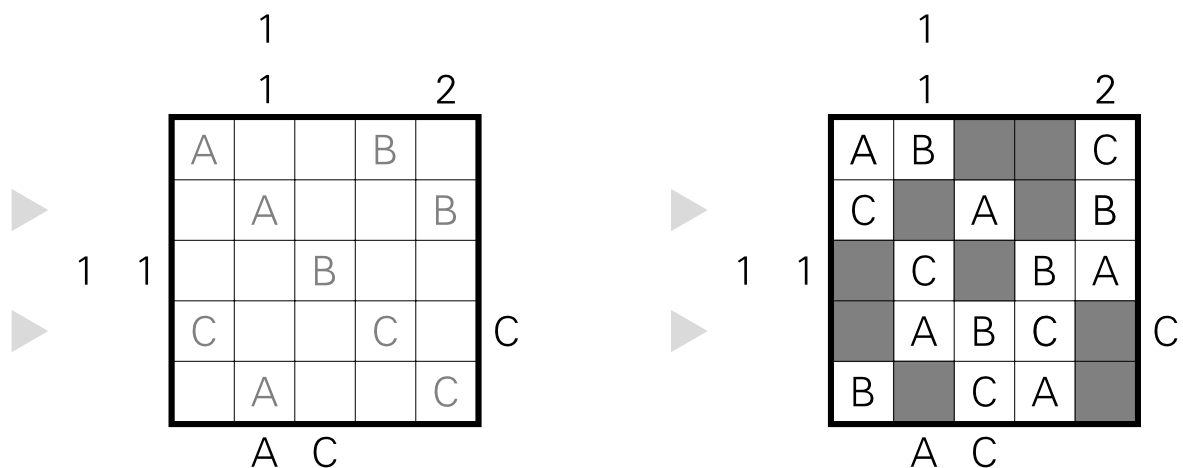**Solution code** The marked rows. Use '-' for blank cells.

The solution code for the example is `--CBA,A--CB`

5&6. BACA 15&75 points

Shade some cells, and fill the remaining cells with letters from A to C, such that each row and each column contains each letter exactly once. Cells with given letters may be shaded, but the letters must not be changed. Clues above and to the left of the puzzle give the lengths of blocks of shaded cells within the corresponding row or column, in the correct order. Clues below and to the right of the puzzle indicate the letter in the first unshaded cell within that row or column, as seen from that point.

Example

Solution code The marked rows. Use '-' for blank cells.

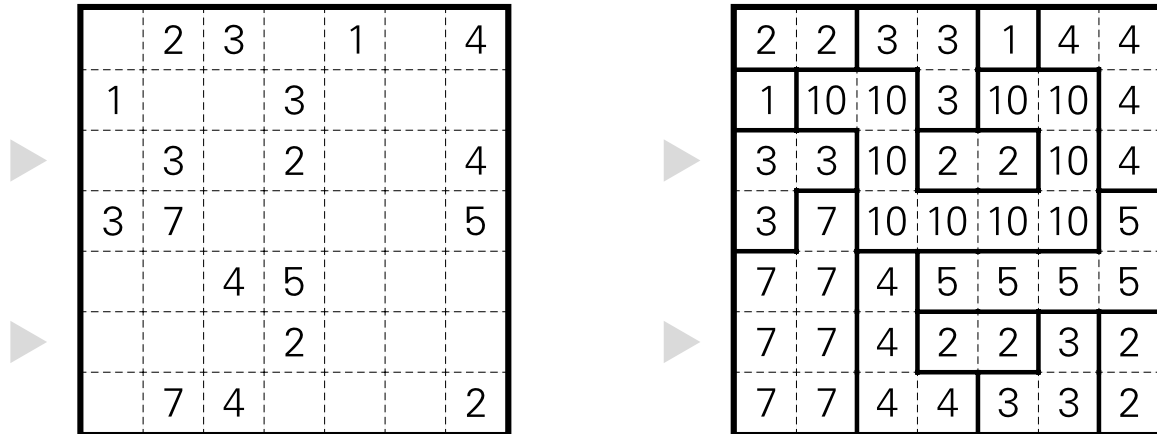*The solution code for the example is* `C-A-B,-ABC-`

7. Fillomino   20 points

Split the grid into areas and place a number in each cell. The numbers within an area must all be equal, equal to the size of the area. Areas of equal size must not touch by edge, but may touch diagonally. Different given numbers may be part of the same area. There may be areas that don't contain any given numbers. Their size may be larger than any given number.

Example

	2	3		1		4
1			3			
	3		2			4
3	7					5
		4	5			
			2			
	7	4				2

2	2	3	3	1	4	4
1	10	10	3	10	10	4
3	3	10	2	2	10	4
3	7	10	10	10	10	5
7	7	4	5	5	5	5
7	7	4	2	2	3	2
7	7	4	4	3	3	2

Solution code The marked rows. Use the last digit for two-digit numbers.

The solution code for the example is `3302204,7742232`

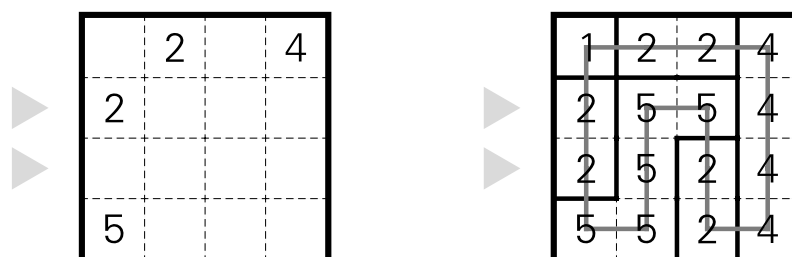# 8. Rundwegfillomino (Loop Fillomino)   60 points

Split the grid into areas and place a number in each cell. The numbers within an area must all be equal, equal to the size of the area. Areas of equal size must not touch by edge, but may touch diagonally. Different given numbers may be part of the same area. There may be areas that don't contain any given numbers. Their size may be larger than any given number.

In addition, it must be possible to draw a loop that goes horizontally and vertically from cell to cell, visiting every cell, and that visits every area exactly once.

Example

	2		4
2			
5			

1	2	2	4
2	5	5	4
2	5	2	4
5	5	2	4

Solution code The marked rows. Use the last digit for two-digit numbers.

The solution code for the example is `2554,2524`

9. Kariertes Fillomino (Checkered Fillomino)   55 points

Split the grid into areas and place a number in each cell. The numbers within an area must all be equal, equal to the size of the area. Areas of equal size must not touch by edge, but may touch diagonally. Different given numbers may be part of the same area. There may be areas that don't contain any given numbers. Their size may be larger than any given number.

In addition, it must be possible to shade some areas fully, such that two shaded areas or two unshaded areas never touch along an edge.

Example
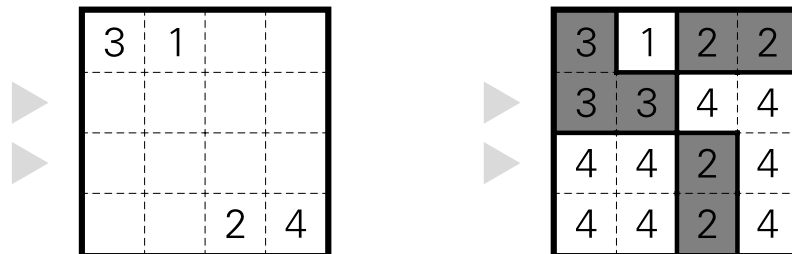
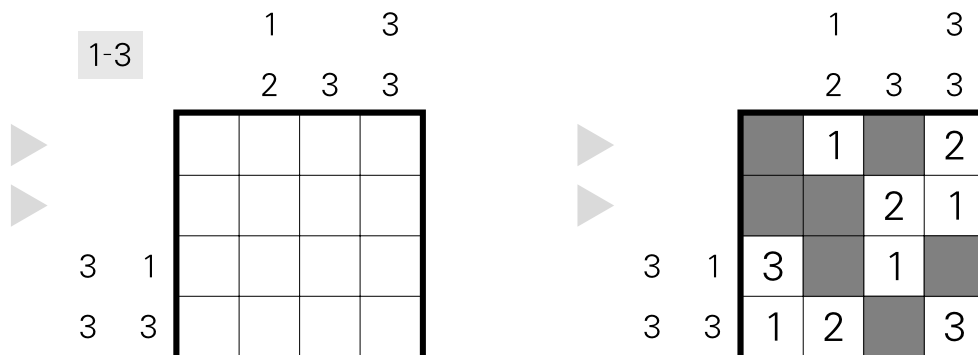**Solution code** The marked rows. Use the last digit for two-digit numbers.

The solution code for the example is `3344,4424`

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10. Japanische Summen (Japanese Sums)   50 points

Shade some cells, and fill the remaining cells with digits from 1 to 9 *(1 to 3 for the example)*, such that no digit occurs more than once in each row or column. The numbers outside the grid indicate the sums of blocks of connected digits in the correct order. This includes single digits.
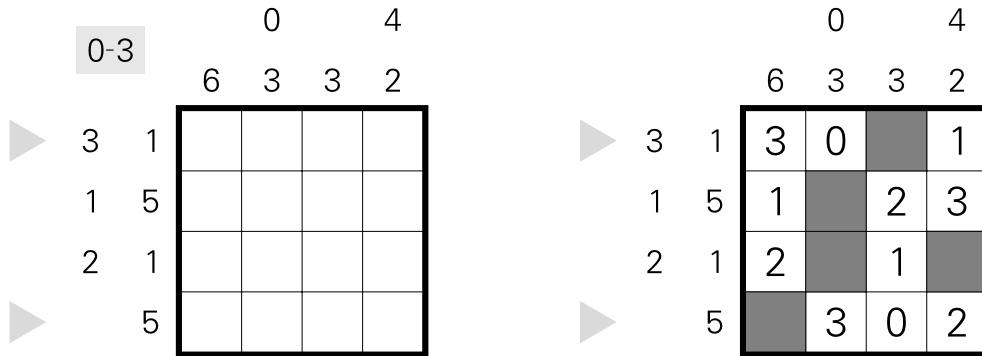
Example

Solution code The marked rows. Use '-' for shaded cells.

The solution code for the example is `-1-2,--21`

11. Japanische Summen mit Null (Jap. Sums with Zero)   55 points

Shade some cells, and fill the remaining cells with digits from 0 to 9 *(0 to 3 for the example)*, such that no digit occurs more than once in each row or column. The numbers outside the grid indicate the sums of blocks of connected digits in the correct order. This includes single digits.

Example

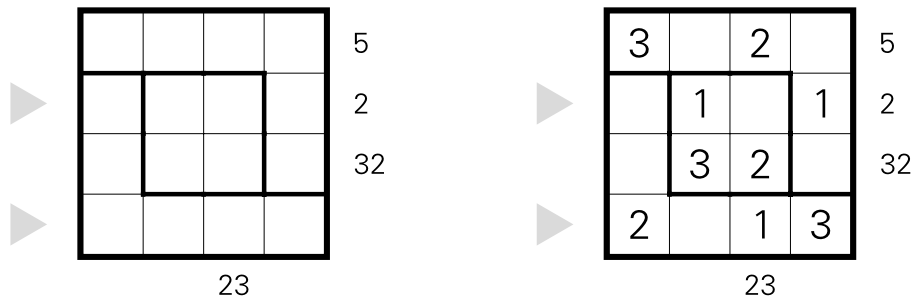**Solution code** The marked rows. Use '-' for shaded cells.

The solution code for the example is `30-1,-302`

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12. Summon   85 points

Place digits from 1 to 3 into some cells, such that cells with the same digit don't touch, not even diagonally. Every digit must occur exactly once in each area.

Connected blocks of digits in a row or column form numbers by reading left to right or downwards, respectively. Clues outside the grid are equal to the sum of all such numbers within the corresponding row or column.

Example

Solution code The marked rows. Use '-' for blank cells.
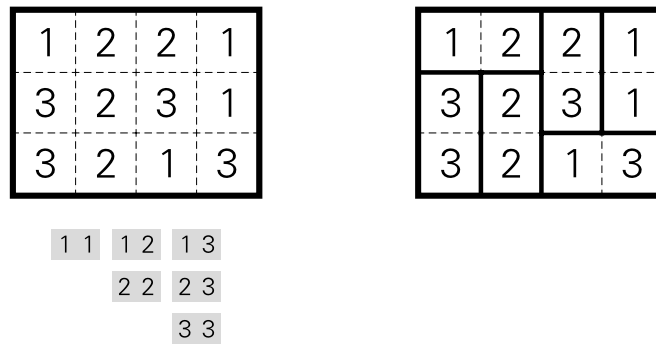
The solution code for the example is `-1-1,2-13`

13. Dominozerlegung (Dominos)   20 points

Split the grid into dominos, such that every combination from 1-1 to 6-6 *(1-1 to 3-3 for the example)* appears exactly once.

Example

1	2	2	1
3	2	3	1
3	2	1	3

1	2	2	1
3	2	3	1
3	2	1	3

```
1 1   1 2   1 3
      2 2   2 3
            3 3
```

Solution code The number of horizontal dominos for each row.

The solution code for the example is `101`

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14. Blackout Domino   55 points

Place the dominos 1-1 to 6-6 *(1-1 to 4-4 for the example)* in the puzzle, such that each domino appears exactly once. Whenever two cells belonging to different dominos meet along an edge, they must contain the same number.

Shade the remaining cells. Shaded cells must not touch each other or the outside of the puzzle by edge. They may touch each other or the outside diagonally.

Example


```
1 1   1 2   1 3   1 4
      2 2   2 3   2 4
            3 3   3 4
                  4 4
```
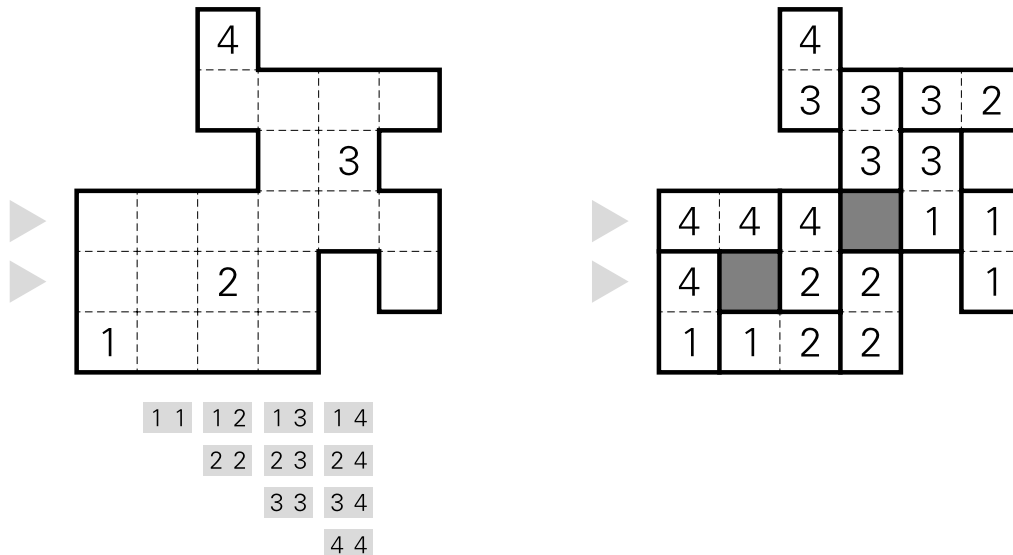
Solution code The marked rows. Use '–' for shaded cells.

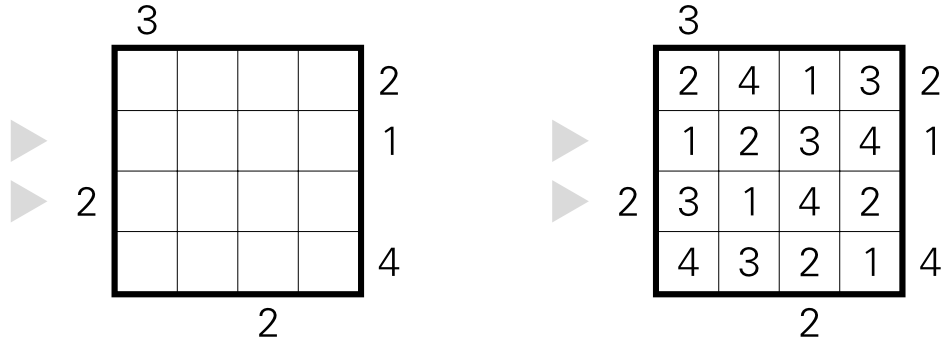*The solution code for the example is* `444-11,4-221`

15. Hochhäuser (Skyscrapers)   15 points

Fill the cells with skyscrapers of heights 1 to 6 *(1 to 4 for the example)*, such that each row and each column contains exactly one of each height. The numbers outside the grid indicate the number of visible skyscrapers when looking along the corresponding row or column from that point. Skyscrapers are blocked from view by those of greater height.

Example

Solution code The marked rows.

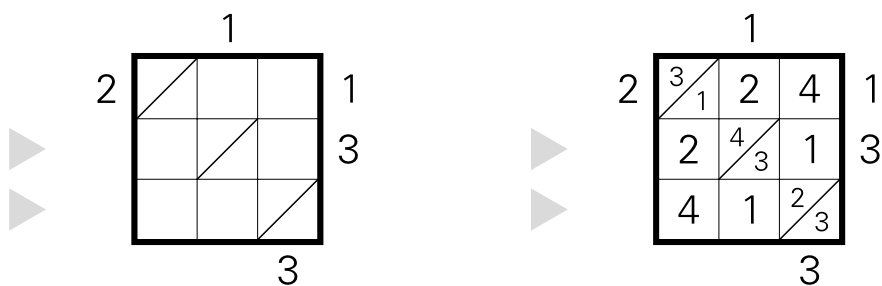*The solution code for the example is* `1234,3142`

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16. Gebrochene Hochhäuser (Fractional Skyscrapers)   35 points

Fill the grid with digits from 1 to 6 *(1 to 4 for the example)*, such that each row and each column contains exactly one of each digit. Put one digit in each half of split cells. Cells correspond to skyscrapers, their height given by the numbers. For split cells, the height is the fraction formed by the two digits.

The numbers outside the grid indicate the number of visible skyscrapers when looking along the corresponding row or column from that point. Skyscrapers are blocked from view by those of equal or greater height.

Example

Solution code The marked rows.

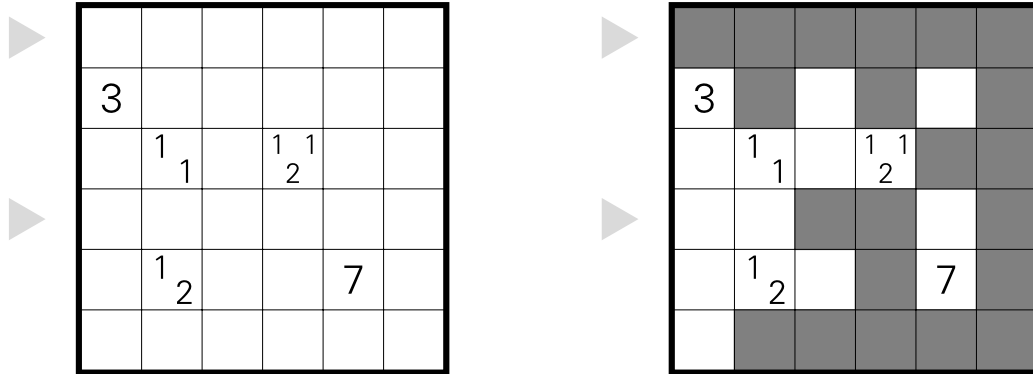*The solution code for the example is* `2431,4123`

17. Tapa   15 points

Shade some cells, such that all shaded cells are connected by edge and such that there is no 2x2-square of shaded cells. Cells that contain numbers must not be shaded. The numbers indicate the lengths of groups of shaded cells within the 8 adjacent cells, where groups consist of cells that are connected by edge, and different groups are separated by one or more unshaded cells. The position and order of numbers within a cell has no meaning.

Example

Solution code The lengths of blocks of cells of the same type, for each of the marked rows. Use the last digit for two-digit numbers.
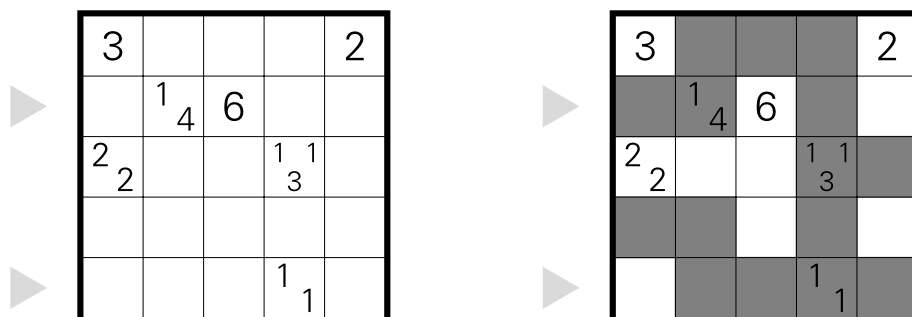
The solution code for the example is `6,2211`

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18. Twilight Tapa   40 points

Shade some cells, such that all shaded cells are connected by edge and such that there is no 2x2-square of shaded cells. The numbers in unshaded cells indicate the lengths of groups of shaded cells within the 8 adjacent cells, where groups consist of cells that are connected by edge, and different groups are separated by one or more unshaded cells. The position and order of numbers within a cell has no meaning. Similarly, the numbers in shaded cells indicate the lengths of groups of unshaded adjacent cells, separated by shaded cells.

Example

Solution code The lengths of blocks of cells of the same type, for each of the marked rows. Use the last digit for two-digit numbers.

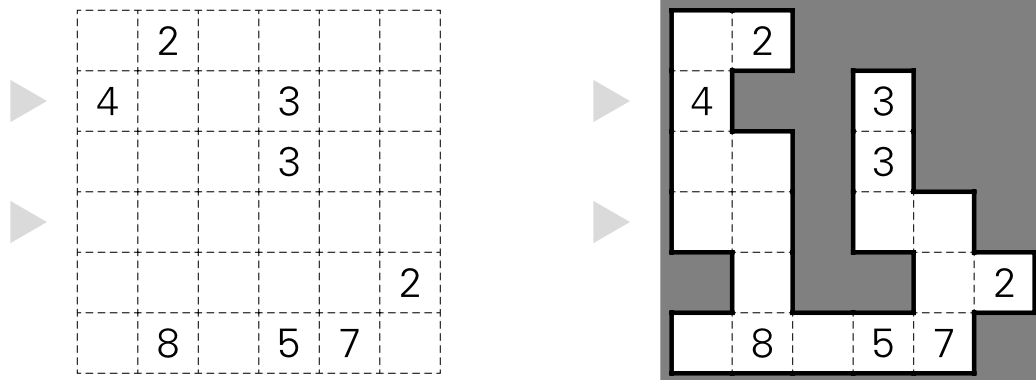*The solution code for the example is* `2111,14`

19. Höhle (Cave)   40 points

Mark an orthogonally connected area of cells that includes all cells with numbers. This area must form a cave: All cells outside the cave are connected orthogonally to the edge of the grid. The numbers within the cave indicate how many cave cells may be seen from that cell by looking in horizontal or vertical direction. This includes the numbered cell itself.

Example

Solution code The lengths of blocks of cells of the same type, for each of the marked rows. Use the last digit for two-digit numbers.

The solution code for the example is `1212,2121`

## 20. Tapa-Höhle (Tapa Cave)   80 points

Shade some cells, such that all shaded cells are connected by edge and such that there is no 2x2-square of shaded cells. The numbers in unshaded cells indicate the lengths of groups of shaded cells within the 8 adjacent cells, where groups consist of cells that are connected by edge, and different groups are separated by one or more unshaded cells. The position and order of numbers within a cell has no meaning.

At the same time, the shaded cells form a cave: All cells outside the cave are connected orthogonally to the edge of the grid. The numbers within the cave, i.e., the shaded numbers, indicate how many cave cells may be seen from that cell by looking in horizontal or vertical direction. This includes the numbered cell itself.

Cells with multiple numbers must remain unshaded.

Example
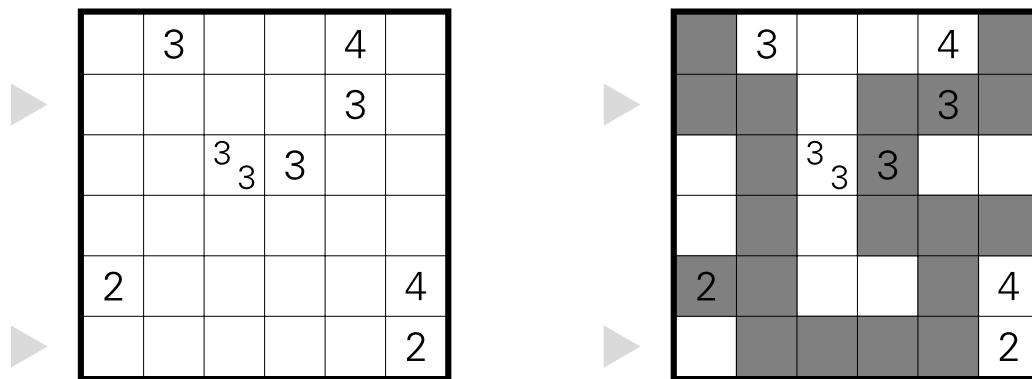
Solution code The lengths of blocks of cells of the same type, for each of the marked rows. Use the last digit for two-digit numbers.
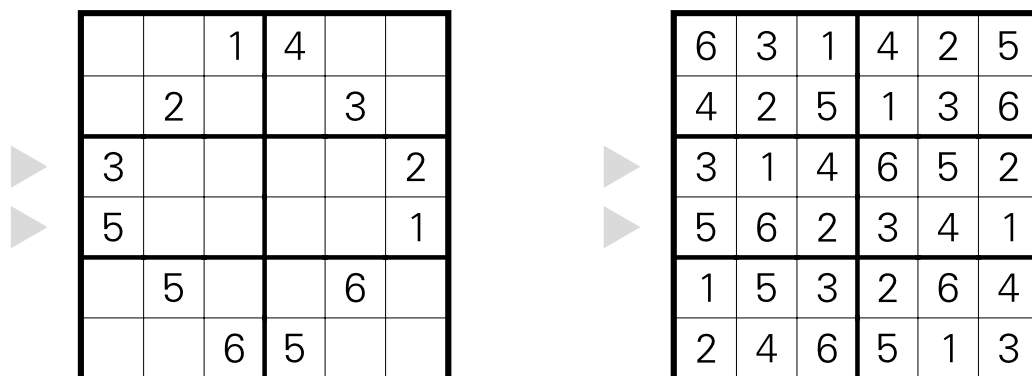
The solution code for the example is `213,141`

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21. Sudoku   45 points

Fill the cells with digits from 1 to 9 *(1 to 6 for the example)*, such that each row, each column and each area contains exactly one of each digit.

Example

Solution code The marked rows.

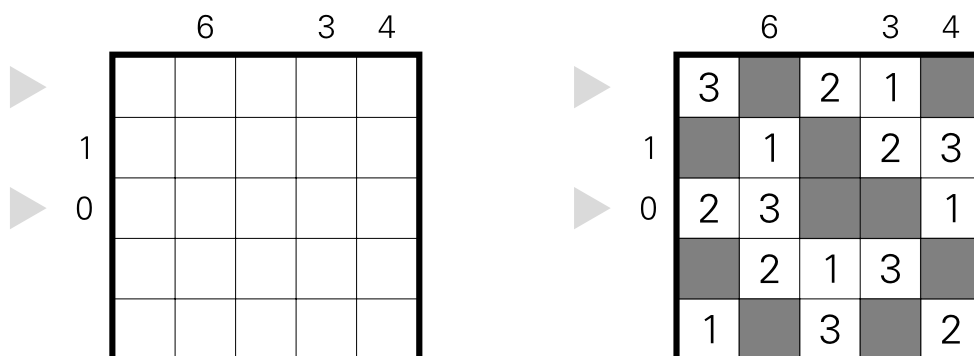*The solution code for the example is* `314652,562341`

22. Doppelblock   35 points

Shade some cells, and fill the remaining cells with digits from 1 to 5 *(1 to 3 for the example)*, such that each row and each column contains exactly two shaded cells and one of each digit. The numbers outside the grid indicate the sums of digits between the two shaded cells within that row or column.

Example

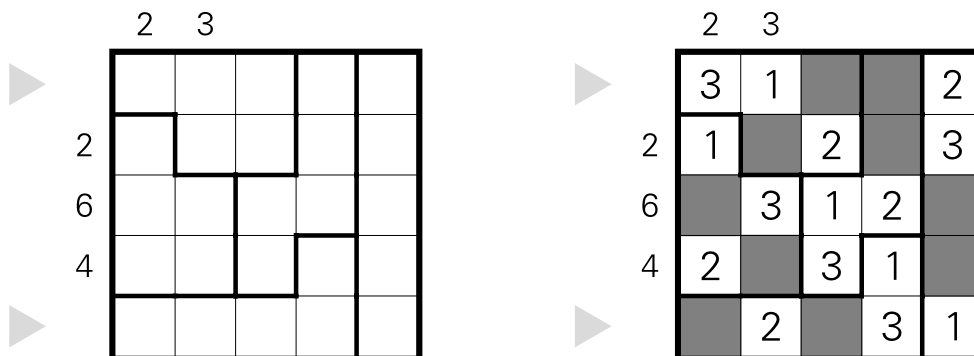**Solution code** The marked rows. Use '-' for shaded cells.

The solution code for the example is `3-21-,23--1`

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23. Doppelblock-Sudoku   35 points

Shade some cells, and fill the remaining cells with digits from 1 to 5 *(1 to 3 for the example)*, such that each row, each column and each area contains exactly two shaded cells and one of each digit. The numbers outside the grid indicate the sums of digits between the two shaded cells within that row or column.

Example

Solution code The marked rows. Use '-' for shaded cells.
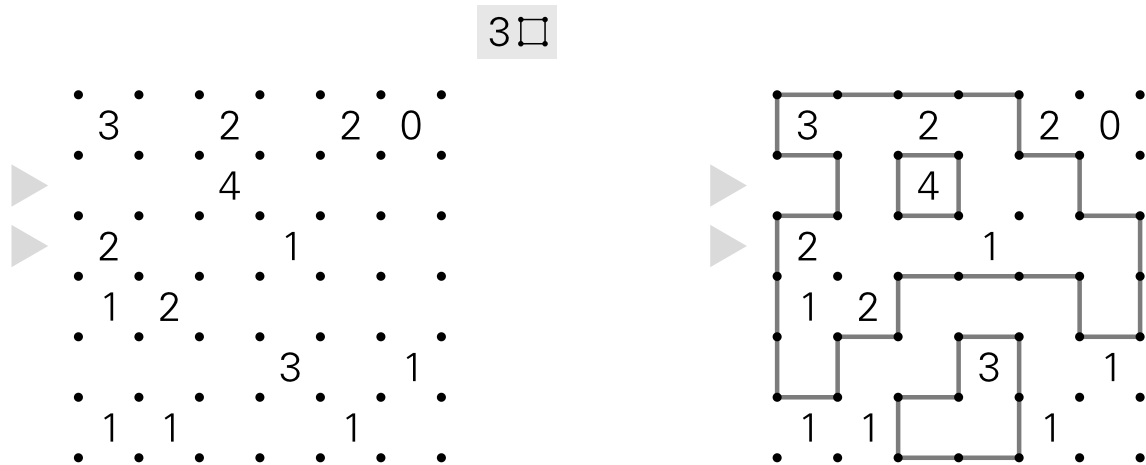
The solution code for the example is `31--2,-2-31`

24. Mehrfach-Rundweg (Multiple Fences)   35 points

Draw five closed loops *(three for the example)* consisting of horizontal and vertical edges between dots. The loops must not touch or intersect themselves or each other. The given numbers indicate the number of adjacent edges that are used by loops.

Example

Solution code The lengths of blocks of connected cells, for each of the marked rows. Use the last digit for two-digit numbers.
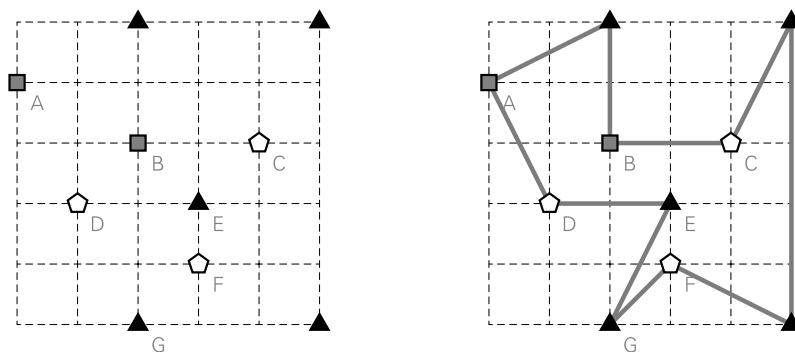
The solution code for the example is `11121,6`

25&26. Winkelrundweg (Angle Loop)   30&65 points

Draw straight lines from clue to clue to form a single loop that doesn't cross or touch itself, and that visits every clue. The loop must turn at every clue, with an angle that is acute ($< 90°$) for triangles, right ($= 90°$) for squares, and obtuse ($> 90°$, $< 180°$) for pentagons.

Example

Solution code The letters as encountered when following the loop in clockwise direction, starting at `A`.

The solution code for the example is `ABCFGED`