Logic Masters 2018
Instructions, First round

Welcome to the first round of the Logic Masters 2018.

The contest begins on Friday, March 2 2018 at 12:00 CET and ends on Monday, March 5 2018 at 23:59 CET. The contest duration is two hours, and the contest can be started at any time during the contest window.

Please ask questions about the instructions in the Logic Masters forum.

The contest file includes German instructions and puzzles, but no examples. It has 17 pages without a cover page.

Authors and test solvers The puzzles were created by Martin Merker and Robert Vollmert.

We wish to thank our test solvers: Bram de Laat, Eva Schuckert, James McGowan, Philipp Weiß, Silke Berendes, Swantje Gährs, Tyge Tiessen, Ulrich Voigt and Will Blatt.

Puzzle overview

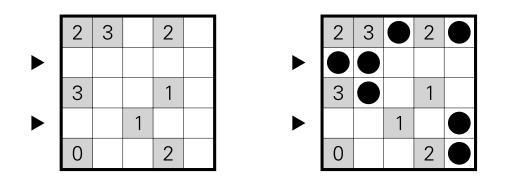|		
1.-3.	Minesweeper	10, 25, 25
4.-6.	Rundweg	15, 20, 40
7.-9.	Doppelblock	10, 20, 65
10.-12.	Zeltplatz	10, 25, 35
13.-15.	Schlange	15, 20, 40
16.-18.	Kropki	15, 20, 60
19.	Country Road	30
20.	Curve Data	40
21.	Koralle LITS	40
22.	Koralle LITSO	75
23.	Pentomische Summen	110
		765

1, 2, 3. Minesweeper

<div align="right">10, 25, 25 points</div>

- Place an arbitrary number of mines in the grid. Don't place mines in cells with numbers.
- The numbers indicate how many mines there are in the cells that are horizontally, vertically or diagonally adjacent.

Example

Solution code The marked rows: '1' for cells with mines, '0' für empty cells and clue cells.
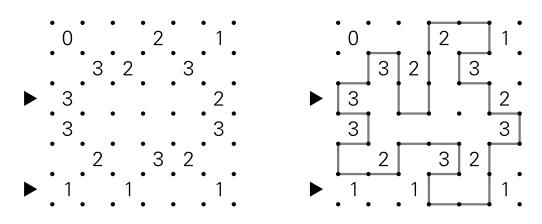
The solution code for the example is `11000,00001`

4, 5, 6. Rundweg

<div align="right">15, 20, 40 points</div>

- Draw a closed loop that consists of horizontal and vertical lines between vertices and that doesn't cross or touch itself.
- The clues indicate how many of the adjacent edges are used by the loop.
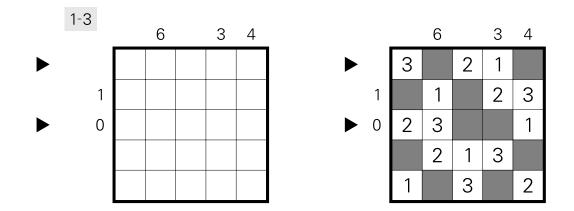
Example

Solution code The marked rows: '1' for cells inside the loop, '0' for cells outside the loop.

The solution code for the example is `110110,000110`

7, 8, 9. Doppelblock   10, 20, 65 points

- Shade two cells in each row and column.
- Fill the remaining cells with numbers from 1 to N, so that each number occurs exactly once in each row and in each column. *(N+2 is the size of the grid; N is indicated next to the grid.)*
- Numbers along the side of the grid indicate the sum of the numbers that are between the two shaded cells in the corresponding row or column.
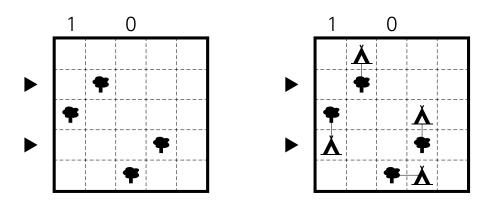
Example

Solution code The marked rows, '-' für shaded cells.

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

10, 11, 12. Zeltplatz   10, 25, 35 points

- Place tents in the grid. Tents can't be placed in cells with trees.
- Every tent is connected to a tree that is horizontally or vertically adjacent to the tent.
- Every tree is connected with exactly one tent.
- Tents can't touch, not even diagonally.
- Numbers along the side of the grid indicate how many tents are placed in the corresponding row or column.
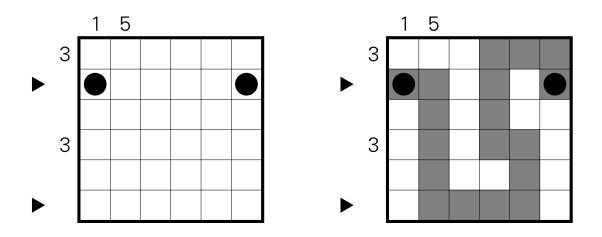
Example

Solution code The marked rows: '1' for tents, '0' for empty cells and trees.

The solution code for the example is `00000,10000`

13, 14, 15. Schlange   15, 20, 40 points

Draw a snake of arbitrary length into the grid:

- Shade some cells; these form the snake.

- The snake cells are connected horizontally and vertically.

- The two marked cells are the ends of the snake; they are part of the snake.

- Each end is horizontally or vertically adjacent to exactly one other snake cell.

- Each further snake cell is horizontally or vertically adjacent to exactly two other snake cells.

- The snake does not touch itself diagonally. *(That is, whenever two snake cells touch diagonally, they have to be connected directly horizontally and vertically through one other snake cell.)*

- Numbers along the side of the grid indicate how many snake cells there are in the corresponding row or column.
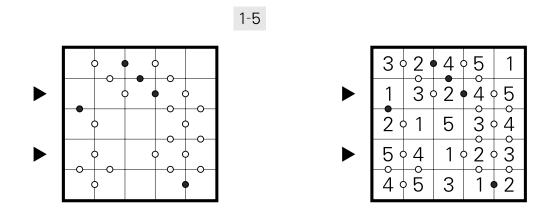
Example

Solution code The marked rows: '1' for snake cells, '0' for empty cells.

The solution code for the example is 110101,011110

16, 17, 18. Kropki   15, 20, 60 points

- Fill the grid with numbers from 1 to N, so that each number occurs exactly once in each row and column. *(N is the size of the grid; N is indicated next to the grid.)*
- If there is a black dot between two cells, one of the two numbers in these cells is equal to double the other number.
- If there is a white dot between two cells, one of the two numbers in these cells is equal to the other number plus 1.
- If there is no dot between two cells, both of the previous two conditions must be false.
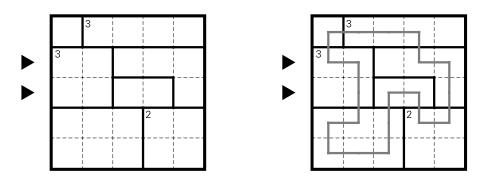
Example

1-5

Solution code The marked rows.

The solution code for the example is `13245,54123`

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19. Country Road   30 points

- Draw a closed loop that consists of horizontal and vertical lines between cells, and that doesn't cross or touch itself.
- The loop visits each boldly outlined area exactly once.
- Clues indicate how many cells within an area are used by the loop.
- Empty cells are not allowed to touch horizontally or vertically if they are in different areas.

Example

Solution code The marked rows: 'L' for cells where the loop turns, 'I' for cells where the loop goes straight, and '-' for empty cells.
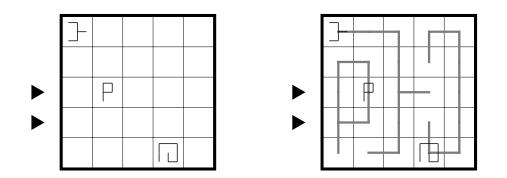
The solution code for the example is `LL-LL,-ILLI`

20. Curve Data   40 points

- Draw lines into the grid that go horizontally and vertically from cell to cell.
- Every cell is connected to exactly one clue along these lines.
- The structure of the lines must be like the clue that they are connected to:
  - Every end, corner and junction in the clue corresponds to a cell center.
  - Two such cell centers are connected by a horizontal or vertical line exactly when the corresponding points in the clue are connected by a horizontal or vertical line, respectively.
  - These straight lines may have arbitrary length (minimal length 1).

Example

Solution code For the marked rows, the lengths of blocks of cells that are connected within that row. *(There are no lengths with more than one digit.)*

The solution code for the example is `1121,2111`

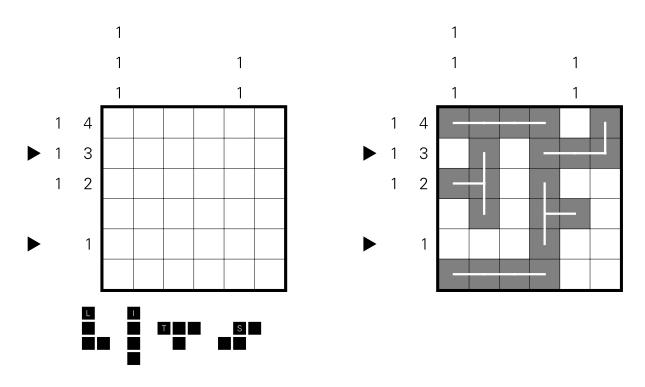# 21. Koralle-LITS   40 points

Draw a coral into the grid:

- Shade some cells; these form the coral.
- The coral cells are connected horizontally and vertically.
- There is at least one empty cell in every 2x2 square.
- All empty cells are connected horziontally and vertically to the edge of the grid.
- The numbers along the side of the grid indicate the lengths of connected coral cells in the corresponding row or column. The numbers are not necessarily given in the correct order.

Additionally,

- The coral consists of tetrominos. A tetromino consists of 4 horizontally and vertically connected cells.
- Whenever two such tetrominos touch along an edge, they must not be "the same".
- Two tetrominos are "the same" when they are the same after reflecting and rotating. *(Thus there are 4 possible different tetrominos in this puzzle: 'L', 'I', 'T' and 'S'.)*

Example

Solution code The marked rows, '1' for coral cells, '0' for empty cells.

The solution code for the example is `010111,000100`

22. Koralle-LITSO   75 points
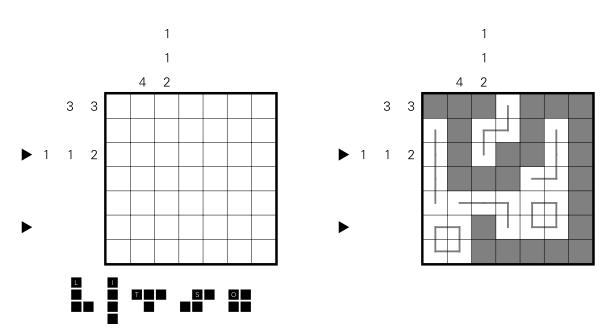
Draw a coral into the grid:

- Shade some cells; these form the coral.

- The coral cells are connected horizontally and vertically.

- There is at least one empty cell in every 2x2 square.

- All empty cells are connected horziontally and vertically to the edge of the grid.

- The numbers along the side of the grid indicate the lengths of connected coral cells in the corresponding row or column. The numbers are not necessarily given in the correct order.

Additionally,

- The emtpy cells consist of tetrominos. A tetromino consists of 4 horizontally and vertically connected cells.

- Whenever two such tetrominos touch along an edge, they must not be "the same".

- Two tetrominos are "the same" when they are the same after reflecting and rotating. *(Thus there are 5 possible different tetrominos in this puzzle: 'L', 'I', 'T', 'S' and 'O'.)*
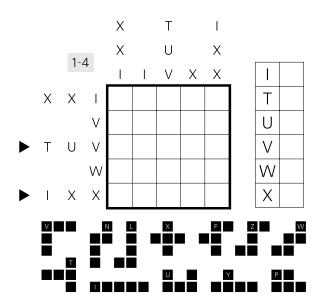
Example

Solution code The marked rows, '1' for coral cells, '0' for empty cells.

The solution code for the example is `0101101,0010001`

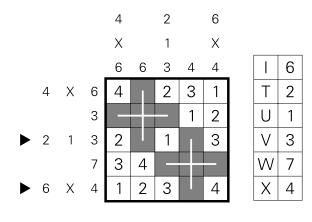# 23. Pentomische Summen   110 points

- Place numbers from 1 to N in the grid, and shade the remaining cells. *N is indicated next to the grid.*
- Within each row and column, each number can occur at most once.
- The black cells consist of pentominos:
  - A pentomino consists of 5 horizontally and vertically connected cells.
  - Pentominos must not touch horizontally and vertically. They may touch diagonally.
  - The same pentominos may occur multiple times.
- Each of the letters outside the grid is either a coded sum clue, or a pentomino clue.
- Each sum clue corresponds to an integer.
  - Sum clues are positive and may be arbitrarily large (they can have multiple digits).
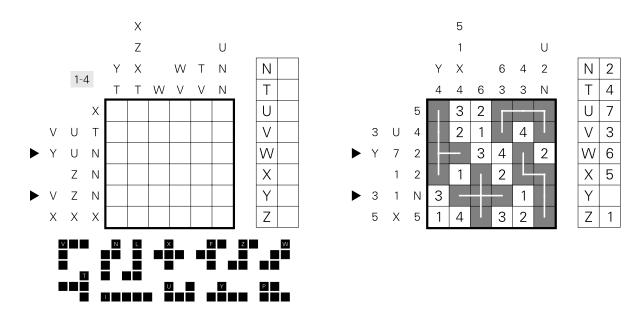 - The same sum clues correspond to the same numbers.
  - Different sum clues correspond to different numbers.
- Any sum clue gives the sum of a group of connected numbers in the corresponding row or column.
- Pentomino clues give the shape of a corresponding pentomino of shaded cells. The pentomino may be reflected and rotated. The association of letters to pentomino shapes is given under the puzzle.
- For each group of one or more connected numbers, there is exactly one sum clue in the corresponding row or column.
- For each pentomino there is exactly one row clue and one pentomino clue, in one of the rows and columns that the pentomino is in, respectively.
- The order of the sum and pentomino clues corresponds exactly to the order of the associated cells. *(In case of the U-pentomino, both position are possible.)*

Example

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

The solution code for the example is 2-1-3,123-4

Zusatzbeispiel

		X				
		Z			U	
1-4	Y	X	W	T	N	
	T	T	W	V	V	N

Left grid row labels: X · V U T · ▶ Y U N · Z N · ▶ V Z N · X X X

N	
T	
U	
V	
W	
X	
Y	
Z	

Right grid headers:
		5				
		1			U	
	Y	X	6	4	2	
	4	4	6	3	3	N

row labels							
	5		3	2			
3	U	4	2	1		4	
▶ Y	7	2		3	4		2
	1	2		1		2	
▶ 3	1	N	3			1	
5	X	5	1	4		3	2

N	2
T	4
U	7
V	3
W	6
X	5
Y	
Z	1

The solution code for the example is `--34-2,3---1-`