









## Round 7 – Mixed Puzzles

**Time limit: 75 minutes**

Time Bonus: 1 points per 20 seconds

### 7.1 Subway – 10 Points

Draw a map of an subway of a city with horizontally and vertically lines from center to center of the fields. The subway can not leave the grid, there are no dead ends and the whole map is connected. At the center of a field, the lines may turn or branch. The numbers at the borders give the corresponding number of the different segments in that row or column. The pieces may be rotated. Fields may remain empty.

					0	1	0	0
					1	1	2	0
					0	1	2	0
					2	1	0	4
								
0	1	1	2					
0	3	0	1					
1	0	1	2					
0	0	1	2					

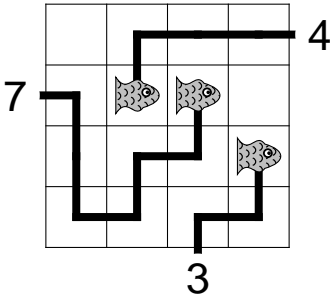
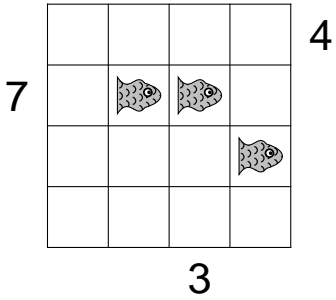
					0	1	0	0
					1	1	2	0
					0	1	2	0
					2	1	0	4
0	1	1	2					
0	3	0	1					
1	0	1	2					
0	0	1	2					

Solution code: Pieces in the second and third row. X for a crossing, T for a branching, I for a straight line, L for a turn and - for an empty square. The answer for the example would be TTTLLXIL.

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## 7.2 Anglers – 10 Points

Draw some lines into the grid going horizontally or vertically from field to field. Every line starts next to an angler given by a number outside the grid and ends at a fish. The number gives the length in fields (including the fish) of that line. Each field may be used by at most one line, some fields may remain empty.



Solution code: Number of turns in each row. The answer for the example would be 1124.

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## 7.3 Snake – 15 Points

Draw a snake into the grid, which moves horizontally and vertically from field to field, and doesn't touch itself, not even diagonally. Hints outside the grid give the number of snake parts in that row or column. The snake parts are numbered from 1 to x. Some parts with numbers may be given, not necessarily the head and tail of the snake.

	5	4	3	3	4	3	6
6							
3							
3				1			
6							18
1							
3	28						
6							

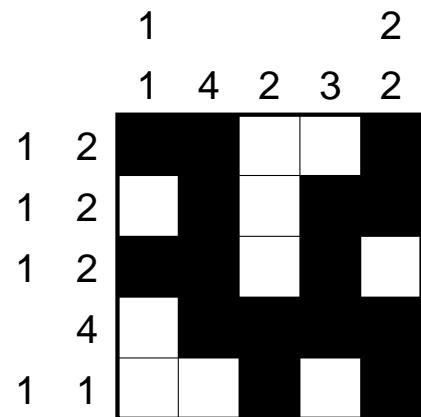
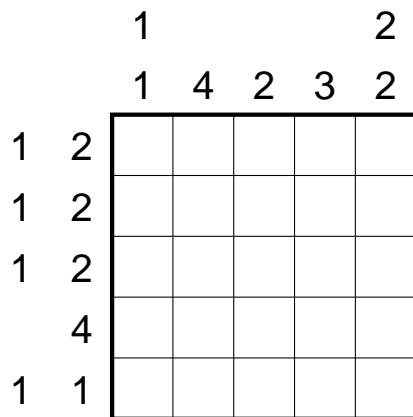
	5	4	3	3	4	3	6
6		10	11	12	13	14	15
3	8	9					16
3	7				1		17
6	6	5	4	3	2		18
1							19
3	28					21	20
6	27	26	25	24	23	22	

Solution code: Longest horizontal segment in each row. The answer for the example would be 6215126.

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## 7.4 Coral – 15 Points

Blacken some fields of the grid so that you get a coral. A coral is connected area of black fields that doesn't contain a 2x2-area of blackened fields and doesn't touch itself (i.e. there is no completely surrounded area of white squares). Hints at the border give the length of blackened blocks in the corresponding row or column, not necessarily in the right order. Between two blocks there has to be at least one white square.

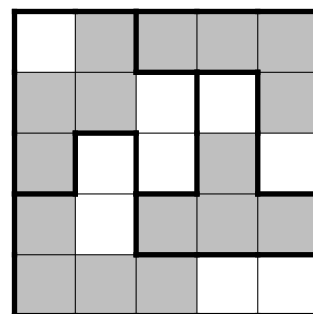
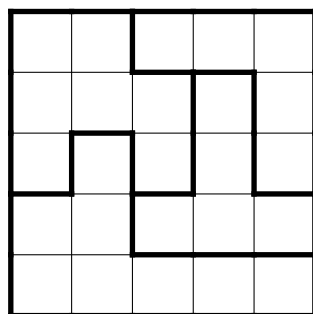


Solution code: The two main diagonals, first from upper left to lower right, then from upper right to lower left. X for a blackened field, - for a white field. The answer for the example would be XX-XXXX-X-.

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## 7.5 LITS – 15 Points

Blacken some fields, so that each marked region contains exactly four orthogonally connected blackened fields. All blackened fields are orthogonally connected and no 2x2-area is completely black. Blackened fields in a region form a tetromino. Same tetrominos may not touch each other orthogonally.



Solution code: Number of blackened squares in each row. The answer for the example would be 43243.

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## 7.6 Pentomino-Figures – 20 Points

The twelve pentominoes were used to form six figures. Each pentomino was used exactly once, but could be mirrored and rotated. The six figures made of the pentominoes and two additional ones are shown below. Mark the two additional figures.

*Examples with three figures and pentominos L, X, Y, Z*

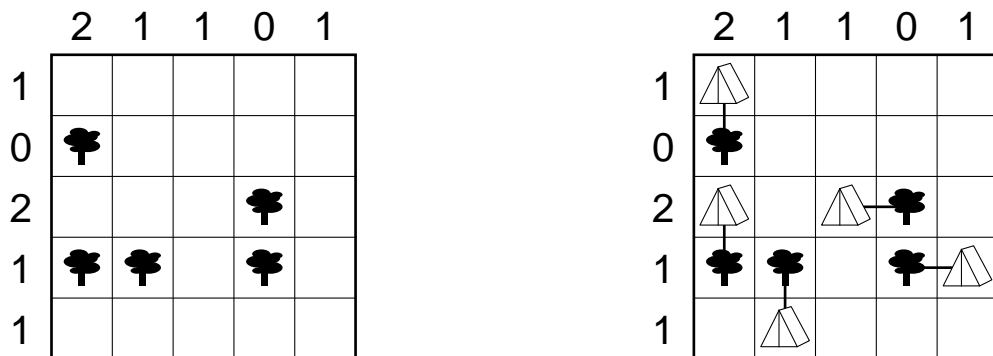


Solution code: The position of the unused figures. The figures are numbered in reading order. The answer for the example would be 3.

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## 7.7 Tents – 25 Points

Draw some tents into the grid, so that every tree has exactly one tent, that is located horizontally or vertically adjacent. Tents do not touch each other, not even diagonally. The numbers at the borders give the number of tents in that row or column.



Solution code: Column number of the leftmost tent for each row. Then the column number of the rightmost tent for each row. 0 for no tent. The answer for the example would be 1015210352.

# 7.8 Magnets – 25 Points

Put neutral and magnetic plates into the grid. Each magnetic plate has two poles (+ and -). There can't be adjacent plate-halves with the same polarity. Hints outside the grid gives the number of the different poles in the corresponding row or column.

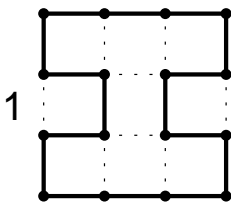
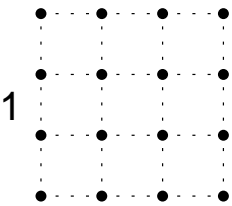
+		1	2	1	1
	-	2	1	1	1
2	1				
0	1				
2	1				
1	2				

+		1	2	1	1
	-	2	1	1	1
2	1	-	+		+
0	1				-
2	1	+	-	+	
1	2	-	+	-	

Solution code: The two main diagonals, first from upper left to lower right, then from upper right to lower left. - and + for the poles and N for a neutral plate. The answer for the example would be -N+N+N-.

# 7.9 Outside Areas – 30 Points

Draw a single closed loop into the grid, which only uses the dashed lines and visits every point exactly once. A hint outside the grid means, that the adjacent field is outside of the loop. The number gives the size of the area outside of the loop in fields.



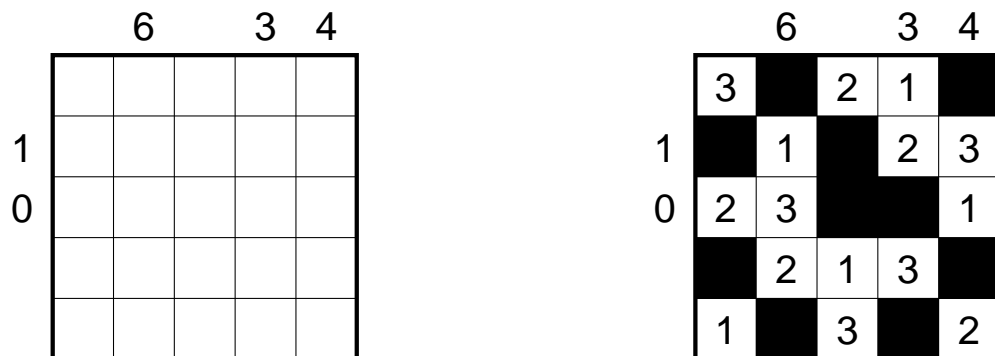
Solution code: For each row the number of squares outside the loop. The answer for the example would be 020.

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## 7.10 Double block – 40 Points

Blacken some fields and put numbers from 1 to 6 into the remaining fields of the grid, so that each number occurs exactly once in each row and column. Hints outside the grid give the sum of the numbers between the two black fields in that row or column.

*Example with numbers 1 to 3*

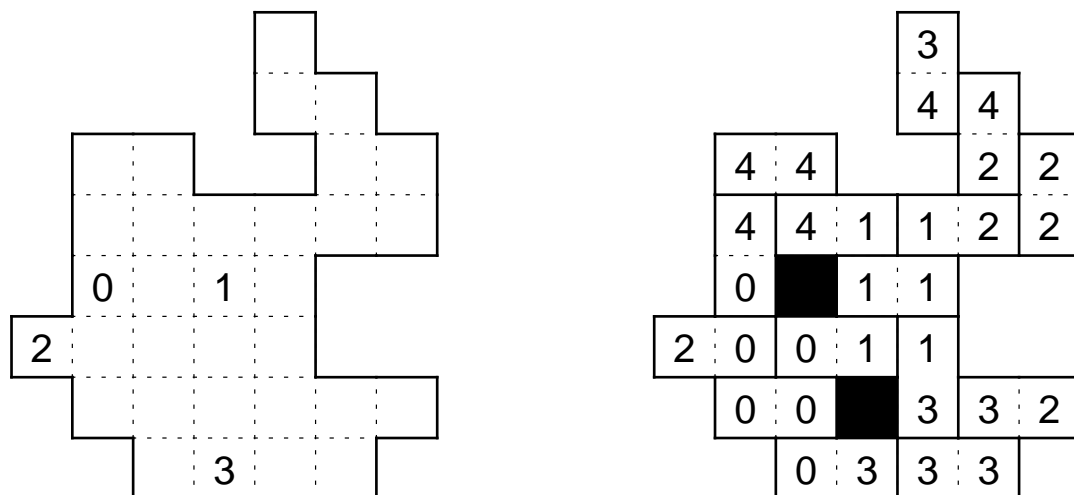


Solution code: The two main diagonals, first from upper left to lower right, then from upper right to lower left. Use - for a blackened field. The answer for the example would be 31-32-2-21.

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## 7.11 Domino – 45 Points

Blacken some fields so that black fields don't share an edge with each other or the border of the grid. Then put the given Domino set into the grid, so that each piece is used exactly once. Adjacent numbers of different Domino-pieces have to be equal.



*Example with Dominos 0-0 to 4-4*

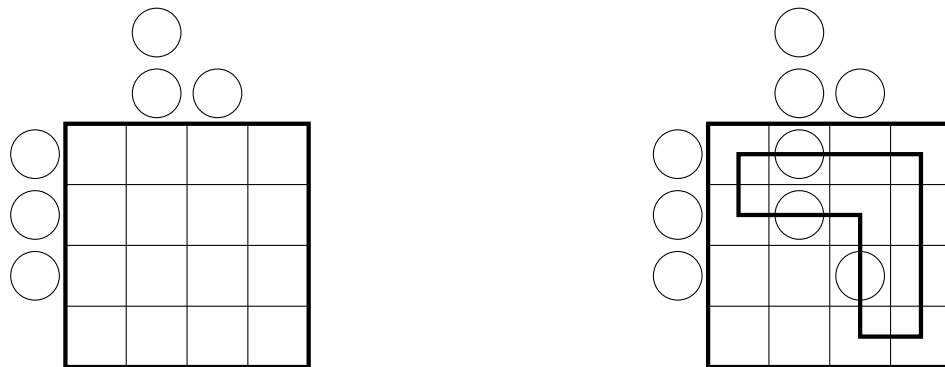
Solution code: The content of each row with a blackened field. Use - for a blackened field. The answer for the example would be 0-1100-332.

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## 7.12 Masyu-Reconstruction – 50 Points

From a correct, i.e. uniquely solvable Masyu-puzzle, all circles were removed. Hints at the border of the grid give all circles in the corresponding row or column in the right order. Reconstruct the Masyu and solve it.

Masyu rules: Draw a single closed loop into the grid which moves horizontally and vertically from field to field, visits every circle, and visits every field at most once. In fields with a black circle, the loop has to make a  $90^\circ$  turn, but has to move straight through the fields before and after the circle. The loop has to go straight through white circles, but makes a  $90^\circ$  turn in the field before or after the circle.



Solution code: The longest horizontal segment for each row. 0 if there are only vertical segments. The answer for the example would be 3201.

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## 7.13 Sudoku with stars – 60 Points

Fill the grid with numbers 1 to 7 and stars, so that each row, column and boldly outlined region contains each number exactly once and two stars. Stars may not touch each other, not even diagonally.

*Example with one star per row, column and region and numbers 1 to 4.*

				3
	3			
4				
				2

2	1	4	★	3
★	3	1	2	4
4	2	★	3	1
3	4	2	1	★
1	★	3	4	2

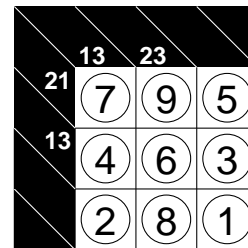
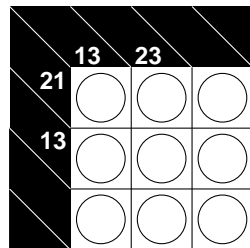
Solution code: The two main diagonals, first from upper left to lower right, then from upper right to lower left. S for a star. The answer for the example would be 23S1232S41.

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## 7.14 Non-consecutive Kakuro with circles – 70 Points

Fill the grid with numbers 1 to 9. A hint gives the sum of the numbers in the corresponding „word“. In a „word“, each number can be used at most once. Adjacent numbers may not have a difference of 1. In the circled fields, each number from 1 to 9 occurs exactly twice.

*Example with each number exactly once in the circled fields.*

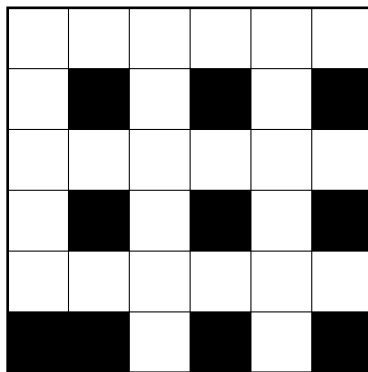


Solution code: From top to bottom in reading order the numbers in the circles. The answer for the example would be 795463281.

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## 7.15 Word puzzle – 70 Points

Put the given words into the white fields of the grid, so that they can be read horizontally and vertically. Fields may remain empty, but empty fields may not be adjacent.



**Words:** *BLKAU, GRÜN, GELB, LILA, PINK, ROT*

Solution code: The number of empty fields for each row. The answer for the example would be 202111.