WPF PUZZLE GP 2022 COMPETITION BOOKLET

Host Country: Slovakia and Czechia

Matej Uher, Karel Štěrba, Jakub Ondroušek

Special Notes: An earlier version of the Instruction Booklet was printed with preliminary point values. The values in this booklet are now final.

1. Easy As [Matej Uher] (12 points)

Place letters of the specified list into some cells, no more than one letter per cell, so that each letter appears exactly once in each row and column. The letters outside the grid indicate the first letter that can be seen in the respective row or column from the respective direction. Some letters may already be filled in for you. Some cells might be marked with a cross; do not put any letters into those cells.

Answer: For each designated row, enter its contents. Do *not* include any letters outside the grid. Use 'X' for an empty cell.

Example Answer: CBXXA, BXXAC

2. Easy As (No Singles) [Matej Uher] (56 points)

Place letters of the specified list into some cells, no more than one letter per cell, so that *no* letter appears exactly once within any row or column. The letters outside the grid indicate the first letter that can be seen in the respective row or column from the respective direction. Some letters may already be filled in for you. Some cells might be marked with a cross; do not put any letters into those cells.

(Note that a letter can appear zero times, two times, or more within a row or column.)

Answer: For each designated row, enter its contents. Do *not* include any letters outside the grid. Use 'X' for an empty cell.

Example Answer: BBXCBC, ABBXAB

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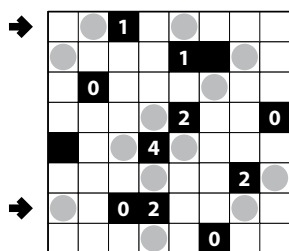**GRAND PRIX**
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3. Akari [Matej Uher] (28 points)

Locate some "light bulbs" in the grid such that every white cell is "lit up". Each bulb occupies a single white cell, and lights up its own cell, as well as white cells in the four orthogonal directions until the light beam encounters a black square or the edge of the grid. A bulb may not illuminate another light bulb. All white cells must be lit up by at least one bulb. A given number in a black cell indicates how many cells orthogonally adjacent to it are occupied by bulbs.

Answer: For each indicated row, enter its contents from left to right. Use 'O' for a cell with a bulb and 'X' for a cell without a bulb. Ignore cell colors and numbers when entering your answer. You may switch the letters, as long as you are consistent.

Example Answer:
XOXXOXXX , OXXXXXOX
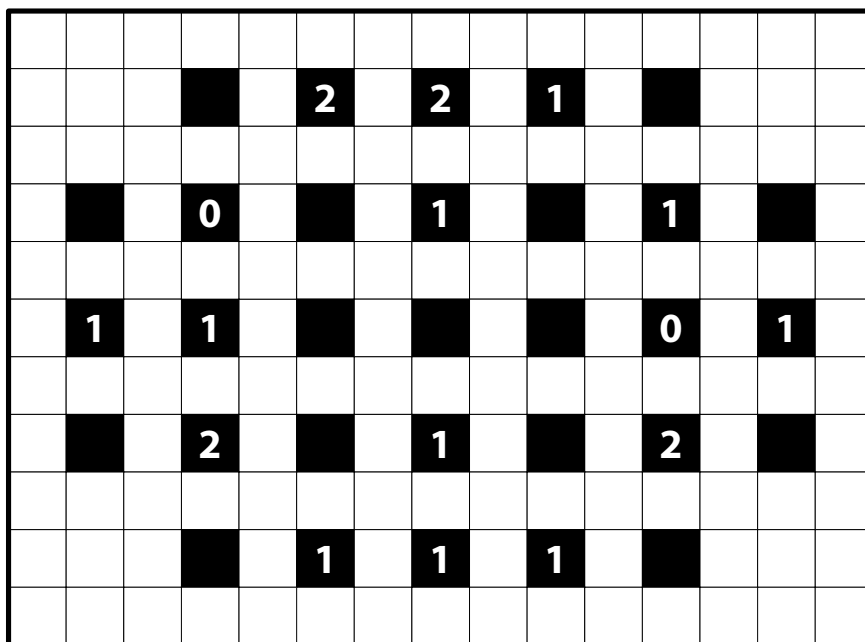
4. Akari (Diagonal Clues) [Matej Uher] (16 points)

Locate some "light bulbs" in the grid such that every white cell is "lit up". Each bulb occupies a single white cell, and lights up its own cell, as well as white cells in the four orthogonal directions until the light beam encounters a black square or the edge of the grid. A bulb may not illuminate another light bulb. All white cells must be lit up by at least one bulb.

A given number in a black cell indicates how many cells diagonally (*not* orthogonally) adjacent to it are occupied by bulbs.

Answer: For each indicated row, enter its contents from left to right. Use 'O' for a cell with a bulb and 'X' for a cell without a bulb. Ignore cell colors and numbers when entering your answer. You may switch the letters, as long as you are consistent.
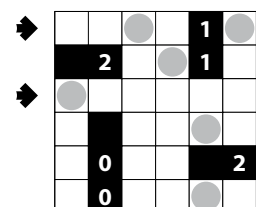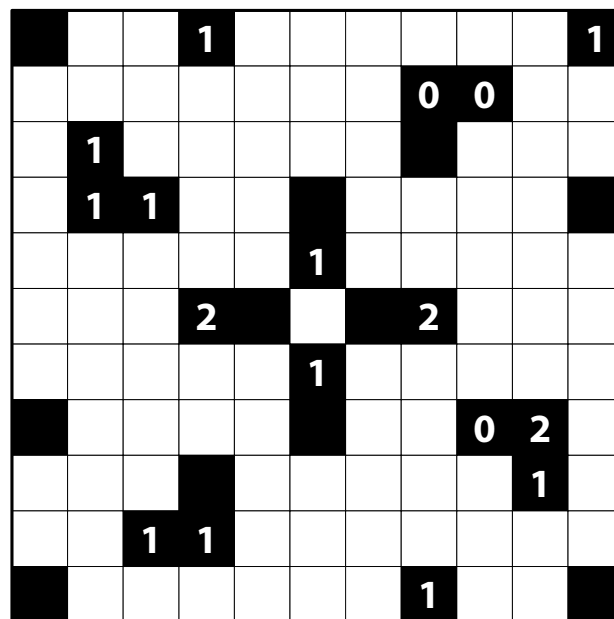
Example Answer: XXOXXO , OXXXXX

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5. Slitherlink [Matej Uher] (35 points)

Draw a single, non-intersecting loop that only consists of line segments between the dots along the dotted lines. A number inside a cell indicates how many of the edges of that cell are part of the loop.

Answer: For each designated row, enter its contents from left-to-right. Use 'O' for a cell inside the loop and 'X' for a cell outside the loop. You may use two other characters, as long as they are distinct.

Example Answer: XXOOX , OXOXX
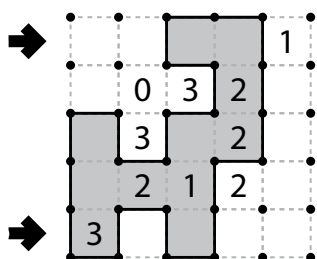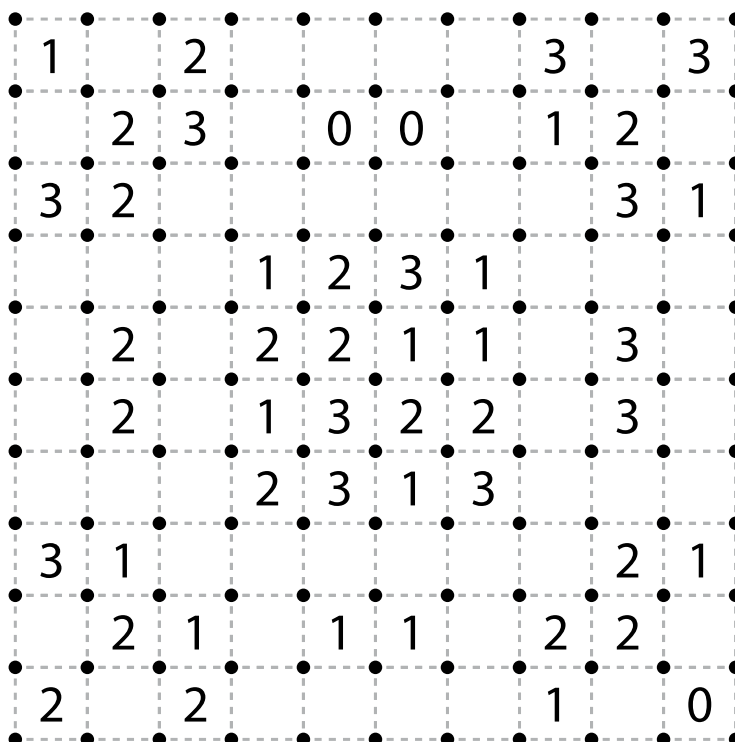
6. Slitherlink (Corners) [Matej Uher] (56 points)

Standard Slitherlink rules, except that a number inside a cell indicates how many of the corners (*not* edges) of that cell are part of the loop.

Example Answer: OOOOO , OXXOO

7. Arukone (Filled) [Karel Štěrba] (8 points)

Some cells in the grid are marked with numbers; each number appears exactly twice and no cell contains more than one number. For each pair of identical numbers, draw a path that connects those two numbers. The paths must go through orthogonally adjacent cells.

Each cell must be visited by exactly one path, and may not be visited more than once by that path.

The dots in cells are only used for entering your answers.

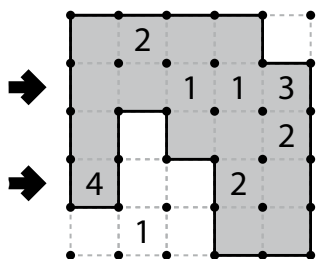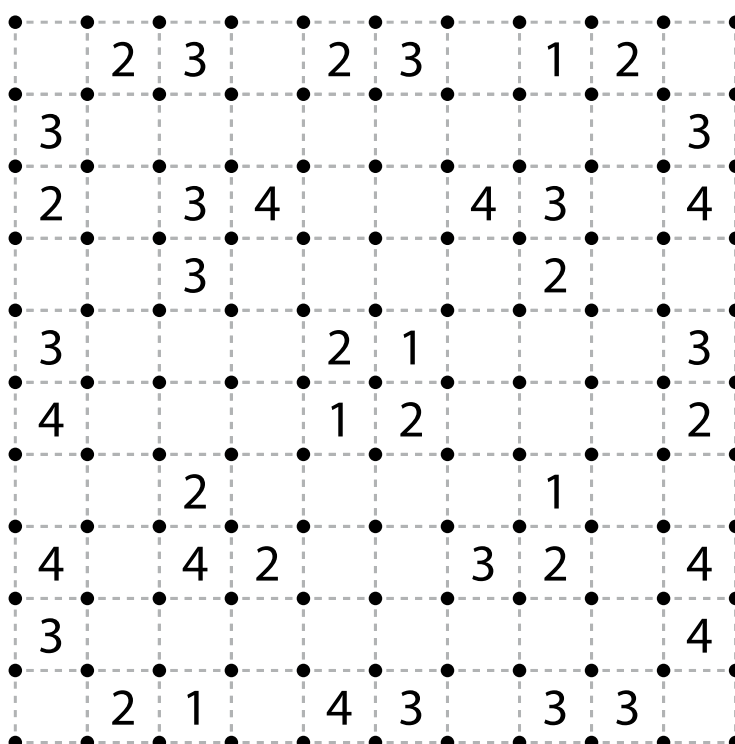**Answer**: Enter one digit for each of the dotted cells, from left to right. Enter the number associated with the path that goes through the cell. Use only the last digit for two-digit numbers; e.g., use '0' if the dot is on the path that connects 10 and 10.

Example Answer:
21113

→ 2 1 1 1 3

7 → ◯◯◯◯◯◯◯◯◯◯◯◯◯◯
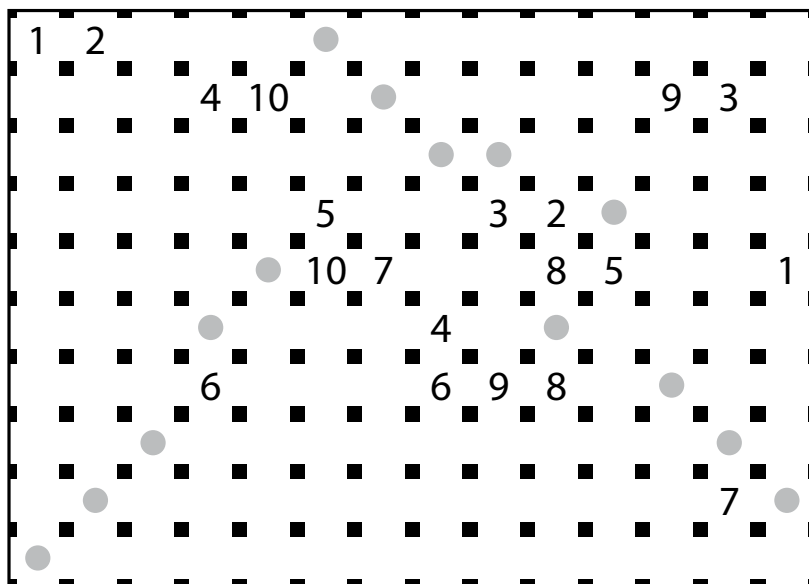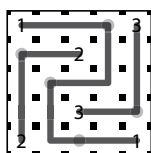
8. Arukone (Filled, CrossCount) [Karel Štěrba] (150 points)

Some cells in the grid are marked with numbers. Draw paths that connect identical numbers; each number must be an endpoint of a path. The paths must go through orthogonally adjacent cells. Each cell must be visited by at least one path.

Paths can intersect, but only when two paths are going straight through the same cell. (A path may not intersect itself.) The numbers at the endpoint of a path must indicate the number of intersections the path goes through.

The contents of some cells may be given. No additional paths may be added to those cells.

The dots in cells are only used for entering your answers.

Answer: Enter one digit for each of the dotted cells, from left to right. Enter the number associated with the path that uses that cell. If the path is on an intersection, enter the sum of the two numbers associated with the two paths that use that intersection. Use only the last digit for two-digit numbers; e.g., use '0' if the dot is on a intersection used by a path that connects 4 and 4 and a path that connects 6 and 6.

Example Answer:
312241

→ 3 1 2 2 4 1

8 → ◯◯◯◯◯◯◯◯◯◯◯◯◯◯

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9. Hitori [Karel Štěrba] (16 points)

Remove some cells from the grid so that all remaining cells are connected orthogonally and no two removed cells are adjacent orthogonally. Additionally, for each row and each column, the numbers in the unremoved cells must be all different.

The numbers on top of the diagram are for Answer purposes only.

Answer: For each row from top to bottom, enter the number (on top) of the *second* column from the left that has a removed cell. Use only the last digit for two-digit numbers; e.g., use '0' if the second removed cell appears in column 10. If fewer than two of the cells in the row are removed, enter '0'.

Example Answer: 40050

Example grid (columns 1 2 3 4 5):

	1	2	3	4	5
4	X	4		X	1
0		1	4	3	2
0	4	X	2	5	3
5	2	3	X		X
0	1	X		2	4

Puzzle 9 grid (columns 1 2 3 4 5 6 7 8 9 0):

1	2	3	4	5	6	7	8	9	0
1	9	2	5	8	4	5	6	3	9
4	3	5	7	8	1	2	9	6	5
8	7	9	2	1	6	9	1	7	4
3	4	7	8	9	7	1	2	6	3
1	8	6	4	3	3	3	7	5	2
5	1	4	2	6	7	7	3	5	6
6	4	8	1	4	2	3	4	9	7
7	5	3	6	5	9	2	2	1	9
9	2	1	3	7	6	8	4	8	6
2	5	3	9	1	8	2	5	4	9

10. Futari [Karel Štěrba] (103 points)

Remove some cells from the grid so that all remaining cells are connected orthogonally and no two removed cells are adjacent orthogonally.

Additionally, for each row and each column, no number may appear more than two times. If a number appears two times within a row or column, they must not be in touching cells.

The numbers on top of the diagram are for Answer purposes only.

Answer: For each row from top to bottom, enter the number (on top) of the *second* column from the left that has a removed cell. Use only the last digit for two-digit numbers; e.g., use '0' if the second removed cell appears in column 10. If fewer than two of the cells in the row are removed, enter '0'.

Example Answer: 40583056

Example grid (columns 1 2 3 4 5 6 7 8):

	1	2	3	4	5	6	7	8
4	X	1	2	X	2			X
0	1		X	2		5		1
5	3	X	4		X		X	4
8				X		5	3	X
3	X					X	4	
0				X			1	1
5	3	X	4	3	X		X	
6		4	X	2	4	X		

Puzzle 10 grid (columns 1 2 3 4 5 6 7 8 9 0 1 2):

1	2	3	4	5	6	7	8	9	0	1	2
2	6	8	6	4	7	5	6	2	3	9	6
2	2	2	8	9	4	6	5	3	9	9	9
7	1	2	3	7	3	6	3	5	4	9	7
1	6	3	4	2	7	4	8	2	5	6	5
2	7	2	4	1	1	6	3	2	6	5	6
2	1	5	8	7	9	7	6	2	7	7	5
3	2	4	1	6	9	8	3	5	8	3	2
4	1	5	4	3	9	5	6	4	3	7	6
2	4	6	3	7	6	4	5	7	3	3	6
7	1	4	3	3	1	7	3	1	2	8	7
5	9	2	4	7	8	5	3	8	9	3	3
3	9	9	1	4	1	2	5	2	4	3	3

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11. Hidato [Jakub Ondroušek] (33 points)

Find a path which starts at one cell and encounters all other cells in the grid exactly once. Numbers provided in the cells indicate the order that cell is encountered along the path, where "1" is the starting cell, "2" is the next cell along the path, and so on. The path may only travel between cells that share an edge or a corner.

It will be helpful for answer submission to write down numbers for all the cells along the indicated rows.

Answer: For each cell in the indicated rows, enter the ordinal number for which that cell is encountered for the first time, from left to right. Use only the last digit for two-digit numbers; e.g., use '0' for the cell encountered 10th.

Example Answer: 44191, 57629

24				4	48
		27			
				51	6
	37	1			
	15			19	54
	33				
	12			56	

11a (arrow to row 4)
11b (arrow to row 8)

12. Hidato (Knight) [Jakub Ondroušek] (117 points)

Find a path which starts at one cell and encounters all other cells in the grid exactly once. Numbers provided in the cells indicate the order that cell is encountered along the path, where "1" is the starting cell, "2" is the next cell along the path, and so on.

The path may only travel between cells that are a chess knight's move apart (two cells in one direction and one cell in an orthogonal direction).

It will be helpful for answer submission to write down numbers for all the cells along the indicated rows.

Answer: For each cell in the indicated rows, enter the ordinal number for which that cell is encountered for the first time, from left to right. Use only the last digit for two-digit numbers; e.g., use '0' for the cell encountered 10th.

Example Answer: 27250, 83816

	57						
23				17	14	35	64
	39			33			
9		59					
				51			1
		41			47		
54	43	6	27				31
					49		

12a (arrow to row 3)
12b (arrow to row 4)

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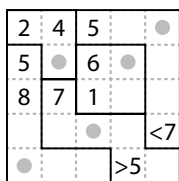## 13. Araf [Matej Uher] (90 points)

Divide the grid along the dotted lines into regions (called polyominoes). Inside some cells are numbers; each polyomino must contain exactly two numbers, and the area of the polyomino (in cells) must be strictly between those two numbers. Some numbers may be prefixed with "<" or ">"; the polyomino containing those numbers must have an area less than or greater than that number, respectively.

The dots in cells are only used for entering your answers.

Answer: For each dot, determine which polyomino it is in and enter the *greater* of the two numbers in that polyomino. Ignore any prefix that number might have. Read the dots from left to right. (Ignore which row the dots are in.) Use only the last digit for two-digit numbers; e.g., use '0' for a dot inside a polyomino where the greater number in it is 10.

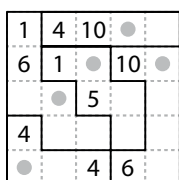**Example Answer**: 84767

➡ (8)(4)(7)(6)(7)
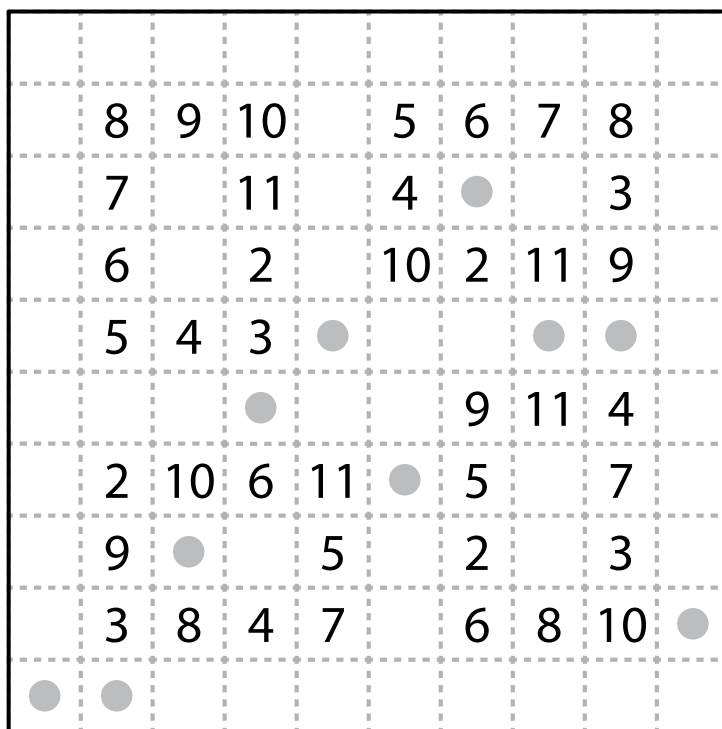
13 ➤ ○○○○○○○○○○○

14. Araf (Anti) [Matej Uher] (64 points)

Divide the grid along the dotted lines into regions (called polyominoes). Inside some cells are numbers; each polyomino must contain exactly two numbers, and the area of the polyomino (in cells) must *not* be strictly between those two numbers. (For example, if the two numbers are consecutive or identical, then the area of the polyomino may be anything.)
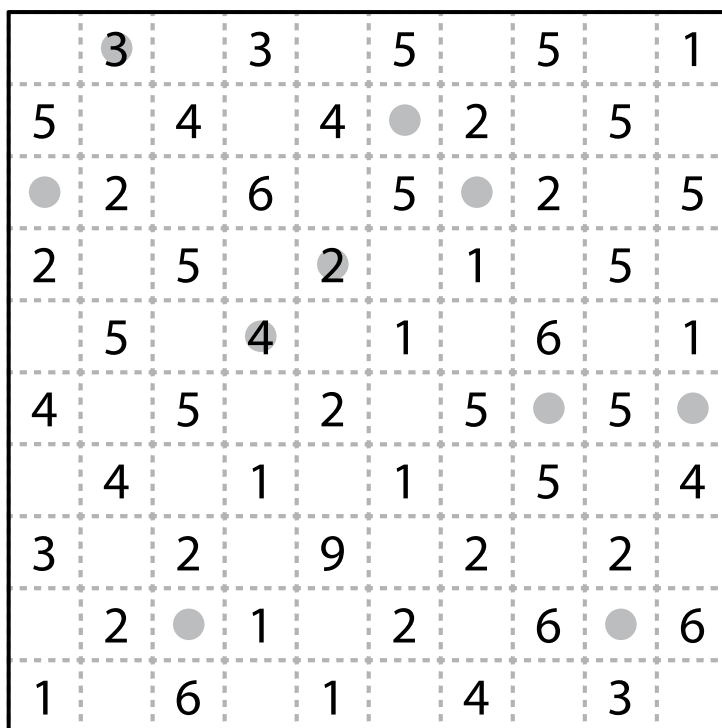
The dots in cells are only used for entering your answers.

Answer: For each dot, determine which polyomino it is in and enter the *greater* of the two numbers in that polyomino. Ignore any prefix that number might have. Read the dots from left to right. (Ignore which row the dots are in.) Use only the last digit for two-digit numbers; e.g., use '0' for a dot inside a polyomino where the greater number in it is 10.

Example Answer: 46500

➡ (4)(6)(5)(0)(0)

14 ➤ ○○○○○○○○○○○

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15. Doppelblock [Jakub Ondroušek] (39 points)

Place either a block or a number from 1 to X (integers only) into each cell so that each number appears exactly once in each row and each column. (X is two fewer than the number of cells in each row.) Each row and each column will therefore have exactly two cells with blocks in them. The numbers outside the grid indicate the sum of the numbers between the two blocks in that row or column. Some cells may already be filled in for you.

Answer: For each designated row, enter its contents from left to right. Use 'X' to denote a block. Use only the last digit for two-digit numbers; e.g., use '0' for the number 10. Do *not* include any given numbers outside the grid.

Example Answer: 21XX3,1X23X

16. Doppelblock (Product) [Jakub Ondroušek] (38 points)

Place either a block or a number from 1 to X (integers only) into each cell so that each number appears exactly once in each row and each column. (X is two fewer than the number of cells in each row.) Each row and each column will therefore have exactly two cells with blocks in them. Some cells may already be filled in for you.

The numbers outside the grid indicate the *product* of the numbers between the two blocks in that row or column. If there are no numbers between the blocks, the product should be considered to be 1.

Answer: For each designated row, enter its contents from left to right. Use 'X' to denote a block. Use only the last digit for two-digit numbers; e.g., use '0' for the number 10. Do *not* include any given numbers outside the grid.

Example Answer: 43XX21,1X43X2