WPF SUDOKU/PUZZLE GRAND PRIX 2021

ROUND 5

WPF PUZZLE GP 2021 INSTRUCTION BOOKLET

Host Country: Japan

Seiu Tei, Yuki Kawabe, Jun Matsuoka, Soji Kubota, Kenshin Ochi

Special Notes: None.

Points:

1.	**Arithmetic Square**	**23**
2.	**Hiroimono**	**6**
3.	**Hiroimono**	**4**
4.	**Hiroimono**	**4**
5.	**Hiroimono**	**6**
6.	**Hiroimono**	**13**
7.	**Hiroimono**	**23**
8.	**Four Winds**	**37**
9.	**Four Winds**	**26**
10.	**Fuzuli**	**25**
11.	**Akari**	**17**
12.	**Pentominous**	**22**
13.	**Statue Park**	**50**
14.	**Sunglasses**	**31**
15.	**Sunglasses**	**41**
16.	**Slitherlink**	**39**
17.	**Nanro Signpost**	**44**
18.	**Nanro Signpost (Yin-Yang)**	**47**
19.	**Maxi Loop**	**53**
20.	**Maxi Loop**	**50**
21.	**Maxi Loop**	**173**
22.	**Ripple Arrows**	**58**
23.	**Double Choco**	**102**
TOTAL:		894

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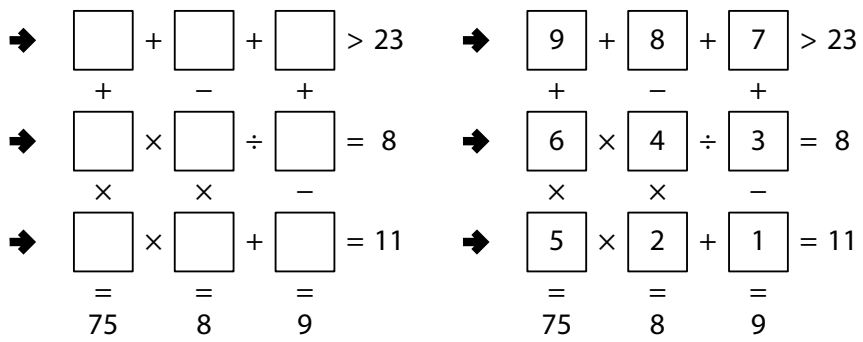
1. Arithmetic Square [Seiu Tei] (23 points)

Place the numbers from 1 to 9 into the cells (a different single number in each cell) so that the indicated equations/ relations are correct. Evaluate from left-to-right and top-to-bottom (ignore the usual precedence of the operators).

It is possible for expressions and partial expressions to be negative or non-integral.

Answer: For each designated row, enter the contents of the cells, in order from left to right.

Example Answer: `987,643,521`



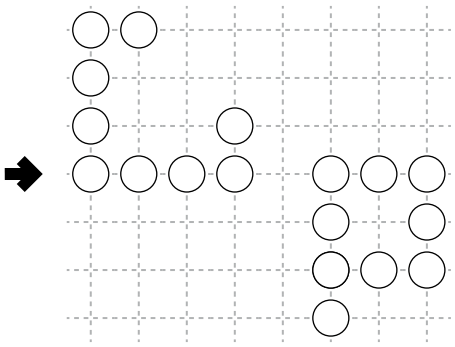
2-7. Hiroimono [Soji Kubota] (6, 4, 4, 6, 13, 23 points)

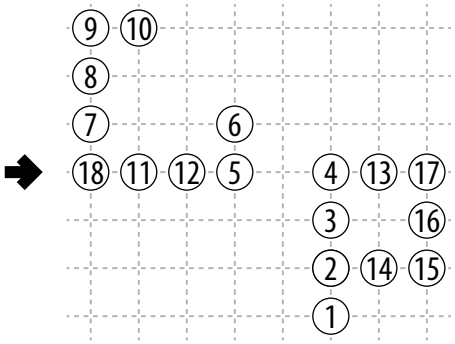
Find a path which starts at one of the stones(circles) and encounters all other stones in the grid. The path may only travel in orthogonal directions, and may only turn at a right angle when it encounters a stone for the first time. (If the path encounters the same stone later, it may not turn then.) The path may not turn at any other angles, including going backwards. (The path may not go through a stone without encountering it. The path may intersect and overlap with itself.)

Instead of drawing the path, it will be helpful for answer submission to write down "1" at the start of the path, then "2" on the next stone encountered, and so on, recording the order in which each stone is encountered for the firsr time.

Answer: For each stone in the indicated row, enter the ordinal number for which that stone 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 stone encountered 10th.

Example Answer: 8125437





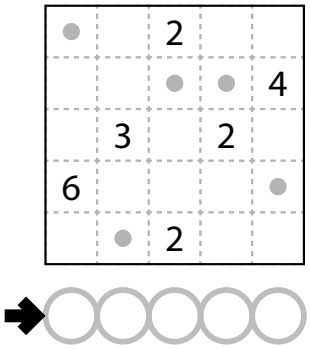
8-9. Four Winds [Seiu Tei] (37, 26 points)

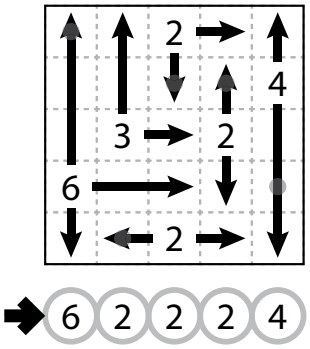
Draw arrows in the empty cells in the grid. Arrows can only go in the four standard directions and must begin at the edge of a cell with a number. Each empty cell must be covered by exactly one arrow. Each number indicates the total length of all the arrows that begin at an edge next to that number's cell.

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

Answer: Enter the number whose arrow covers the dot, reading 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 number labeled 10.

Example Answer: 62224



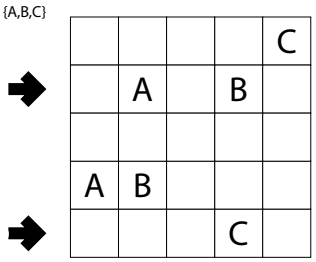


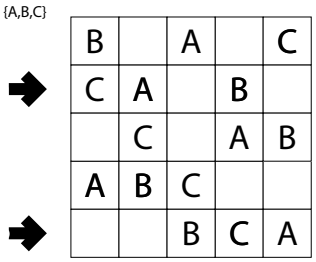
10. Fuzuli [Yuki Kawabe] (25 points)

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. No 2×2 group of cells can be entirely filled with letters.

Answer: For each designated row, enter its contents. Use 'X' for an empty cell.

Example Answer: CAXBX, XXBCA



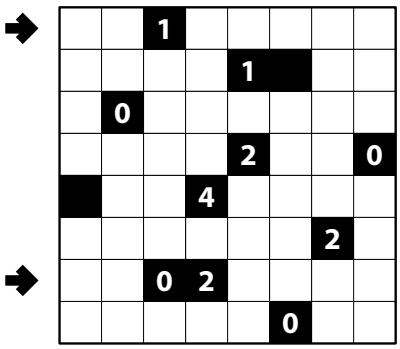


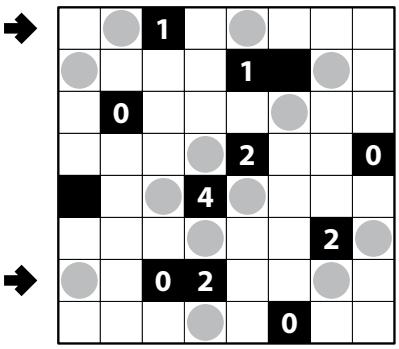
11. Akari [Yuki Kawabe] (17 points)

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`





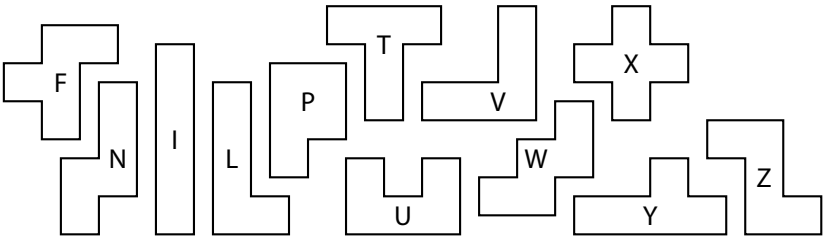
12. Pentominous [Jun Matsuoka] (22 points)

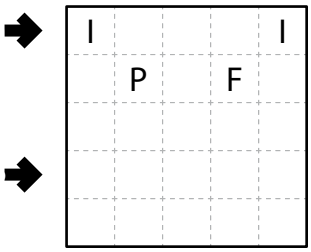
Divide the grid into pentominoes such that every cell in the grid is part of exactly one pentomino. Pentominoes of the same shape (rotations and reflections of a pentomino count as the same shape) cannot touch each other along an edge (but they may touch diagonally). Some letters are given in the grid. Each letter must be part of a pentomino with that letter's shape. It is permissible for a pentomino to contain more than one letter. (It is possible for some pentomino shapes to never appear in the grid, or more than once.)

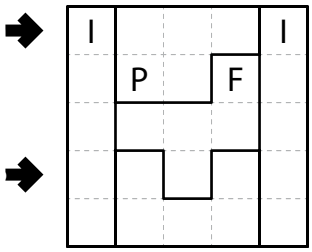
The letter-to-shape correspondence for pentominoes has been supplied for you.

Answer: For each designated row, enter the letter for the pentomino that each cell belongs to, from left to right.

Example Answer: `IPPPI,IUFUI`

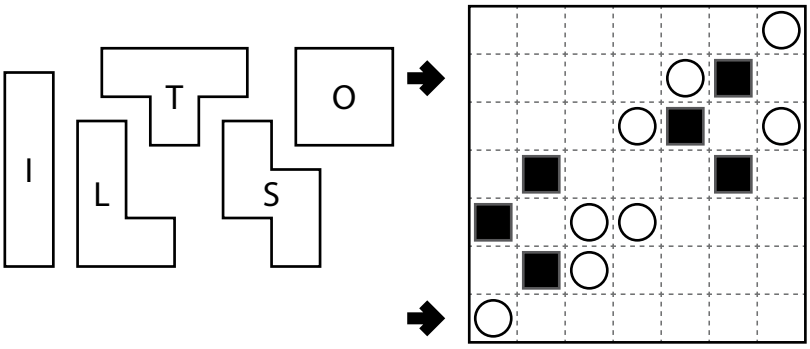






13. Statue Park [Soji Kubota] (50 points)

Shade some cells black (leaving the other cells white) so that the grid is divided into non-overlapping regions; cells of the same color are considered in the same region if they are adjacent along edges. The black regions must form the set of given shapes; each shape may be rotated and/or reflected in the final answer. Shapes cannot touch along an edge, but can touch at corners. All white cells must be in the same region.

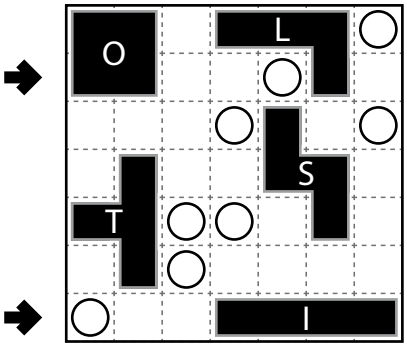


A cell with a black square must be shaded and a cell with a white circle must not be shaded.

The letters on the given shapes are only for entering your answer.

Answer: For each designated row, enter the contents of each cell, from left to right. For each cell, its contents are the letter of the shape occupying that cell, or the letter 'A' if the cell is not shaded.

Example Answer: OOAAALA,AAAIIII



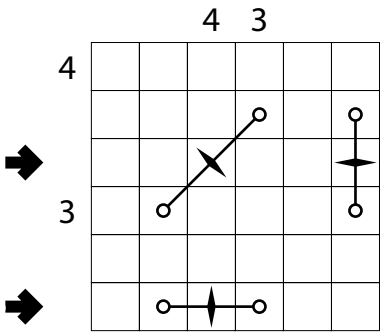
14-15. Sunglasses [Yuki Kawabe, Soji Kubota] (31, 41 points)

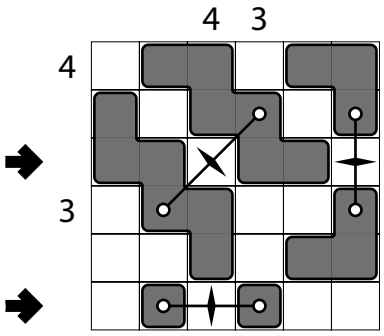
Locate some "sunglass lenses" in the grid, based on the given "sunglass bridges". Each bridge is a given symmetric shape in the grid with two endpoints. Each lens is a single region connected along edges; exactly one cell of each lens is an endpoint of a bridge, and each bridge endpoint is part of one lens. Bridge cells that are not endpoints must not be part of lenses. Cells belonging to different lenses may not share an edge. The two lenses connected by a bridge must have the same shape, reflected across the line of symmetry of that bridge (marked with a small diamond).

The numbers on the left and top edges of the grid reveal the number of cells occupied by lenses in that row or column.

Answer: For each designated row, enter its contents from left-to-right. Use 'O' for a cell that is part of a lens and 'X' for a cell that is not part of a lens. You may use two other characters, as long as they are distinct.

Example Answer: OOXOOX,XOXOXX



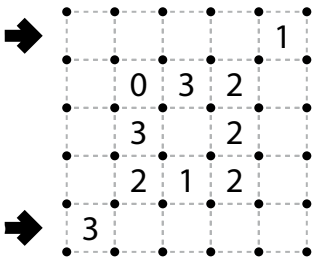


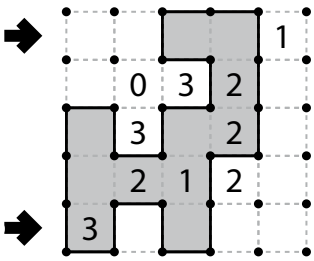
16. Slitherlink [Soji Kubota] (39 points)

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





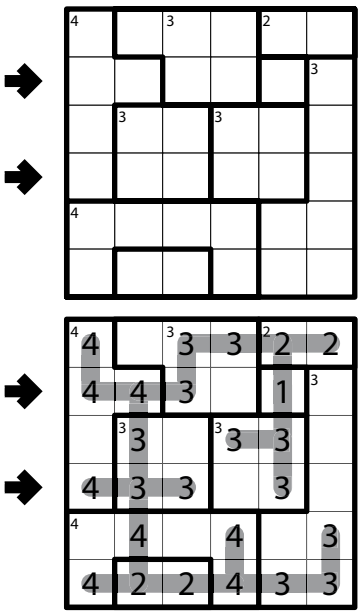
17. Nanro Signpost [Jun Matsuoka] (44 points)

Label some cells with numbers such that each bold region contains at least one labeled cell. Each number (including any given numbers) must equal the total count of labeled cells in that region; for some regions, that number is given to you in the upper-left cell of the region (but not which cells are labeled). When two labeled cells from different regions are connected orthogonally, they must contain different numbers. All labeled cells are connected orthogonally. No 2×2 group of cells can be entirely labeled.

While not required, it may be helpful to draw connecting lines between labeled cells (as in the displayed solution).

Answer: For each designated row, enter its contents, from left to right. Use 'X' for an unlabeled cell. Use only the last digit for two-digit numbers; e.g., use '0' for a cell labeled with 10.

Example Answer: `443X1X,433X3X`



18. Nanro Signpost (Yin-Yang) [Jun Matsuoka] (47 points)

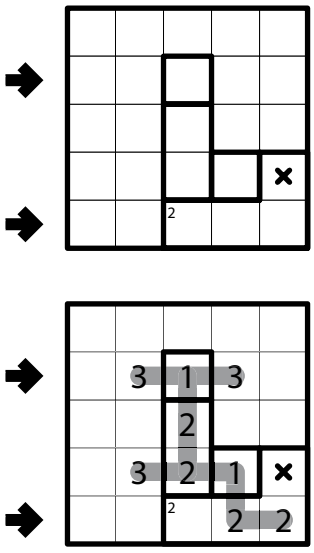
Label some cells with numbers such that each bold region contains at least one labeled cell. Each number (including any given numbers) must equal the total count of labeled cells in that region; for some regions, that number is given to you in the upper-left cell of the region (but not which cells are labeled). When two labeled cells from different regions are connected orthogonally, they must contain different numbers. All labeled cells are connected orthogonally. No 2×2 group of cells can be entirely labeled.

All unlabeled cells are connected orthogonally. No 2×2 group of cells can be entirely unlabeled. Some unlabeled cells may be given to you (marked with an X in the grid).

While not required, it may be helpful to draw connecting lines between labeled cells (as in the displayed solution).

Answer: For each designated row, enter its contents, from left to right. Use 'X' for an unlabeled cell. Use only the last digit for two-digit numbers; e.g., use '0' for a cell labeled with 10.

Example Answer: `X313X,XXX22`

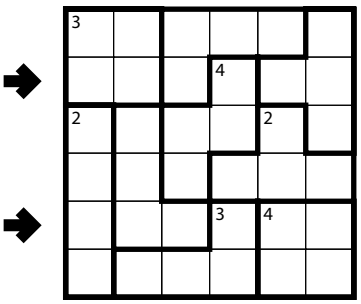


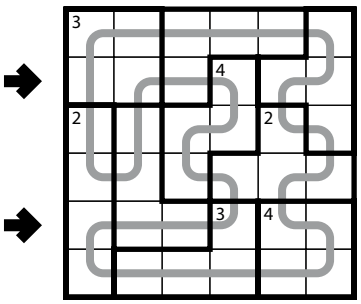
19-21. Maxi Loop [Seiu Tei, Seiu Tei, Kenshin Ochi] (53, 50, 173 points)

Draw a single closed loop that only travels orthogonally and goes through every cell exactly once. A number given in a region indicates the longest (uninterrupted) length of the loop in that region.

Answer: For each designated row, enter its contents from left to right. Use 'I' for a cell in which the loop goes straight, and 'L' for a cell in which the loop turns. You may use two other characters, as long as they are distinct.

Example Answer: `ILILLL,LIILLL`





22. Ripple Arrows [Soji Kubota] (58 points)

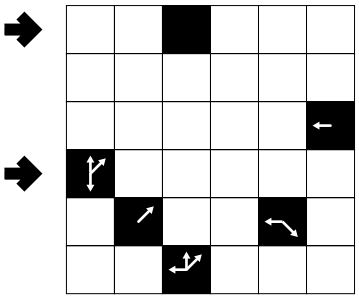
Place numbers of the specified list into cells, no more than one number per cell, so that each number appears exactly once in each row and column and all numbered cells are connected along the eight standard directions.

Black cells cannot contain numbers. An arrow in a black cell points to a number that is exactly its own value (in cells) away from that black cell in one of the eight standard directions. Absence of an arrow means there are no such numbers in that direction. An arrow may point to more than one such number.

Answer: For each designated row, enter its contents. Use '`X`' for a cell without a number (including black cells).

Example Answer: `32XX1X,XX1X32`

{1...3}



{1...3}

3	2	■		1	
1			3	2	
	1	3	2		■
■		1		3	2
	■	2	1	■	3
2	3	■			1

23. Double Choco [Kenshin Ochi] (102 points)

Divide the grid along grid lines into regions. Each region must contain one group of connected white cells and one group of connected gray cells. Both connected groups must form the same shape (rotations and reflections are allowed). Numbers indicate the area of the group (not region) that number is in. Regions may contain multiple given numbers or no numbers.

The squares in gray cells are only to make them distinctive in poor printing conditions. The dots in cells are only used for entering your answers.

Answer: Enter the area of the group (not region) each dot is in, reading 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 polyomino of size 10.

Example Answer: `433224`