WPF SUDOKU/PUZZLE GRAND PRIX 2016

ROUND 6

WPF PUZZLE GP 2016 INSTRUCTION BOOKLET

Host Country: Serbia

Nikola Živanović, Čedomir Milanović, Branko Ćeranić

Special Notes: None for this round.

Points, Casual Section:

1.	**Letter Weights**	18
2.	**Letter Weights**	45
3.	**Letter Weights**	83
4.	**Graffiti**	6
5.	**Graffiti**	11
6.	**Graffiti**	18
7.	**Balance**	54
8.	**Find the Pair**	22
9.	**Word Search**	30
10.	**Bent Word Search**	39
11.	**Password Path**	7
12.	**Password Path**	32
13.	**Arithmetic Square**	7
14.	**Arithmetic Square**	26
TOTAL:		398

Points, Competitive Section:

15.	**Yajilin**	3
16.	**Yajilin**	17
17.	**Yajilin**	30
18.	**Lighthouses**	6
19.	**Lighthouses**	9
20.	**Lighthouses**	17
21.	**Kuromasu**	14
22.	**Kuromasu**	11
23.	**Kuromasu**	22
24.	**Tapa LITS**	5
25.	**Tapa LITS**	16
26.	**Tapa LITS**	41
27.	**Pentominous**	16
28.	**Pentominous**	12
29.	**Pentominous**	34
30.	**Scrabble**	25
31.	**Scrabble**	34
32.	**Scrabble**	41
33.	**Easy as... No Touching**	16
34.	**Easy as... No Touching**	24
TOTAL:		393

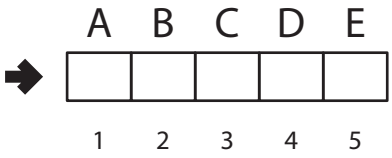
Casual Section (398 total points)

1-3. Letter Weights [Branko Ćeranić] (18, 45, 83 points)

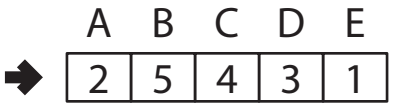
Write a number under each letter (in each cell) so that the numbers corresponding to the letters in each given word have the given sum. Different letters must have different numbers. The list of allowed numbers is given in a row underneath the cells.

Answer: Enter the contents of the cells, from left to right. Enter all digits for multi-digit numbers (for example, if the cell contents were 12, then 5, then 25, enter `12525`).

Example Answer: `25431`



CAB = 11
BEE = 7
ABE = 8

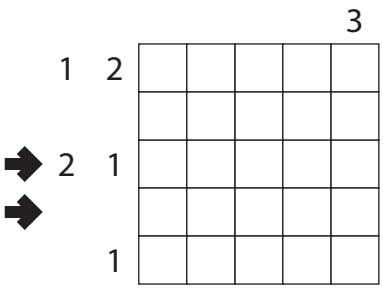


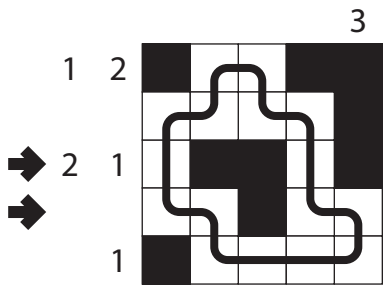
4-6. Graffiti [Branko Ćeranić] (6, 11, 18 points)

Blacken some cells in the grid and draw a closed loop through all other cells in the grid. The loop connects the centers of cells orthogonally, and never goes through a cell more than once. Some rows have number clues next to them. The numbers represent, in left-to-right order, the exact size of groups of consecutive black cells in those rows. Groups are separated by at least one non-blackened cell. As a special case, if the clue '0' is given, it means there are no blackened cells in that row. Similar clues may be given for some columns (using top-to-bottom order).

Answer: For each designated row, enter its contents from left to right. Use '`X`' for a black cell, '`I`' for a cell in which the loop goes straight, and '`L`' for a cell in which the loop turns.

Example Answer: `IXXIX,LLXLL`



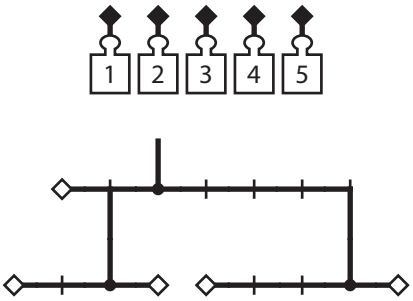


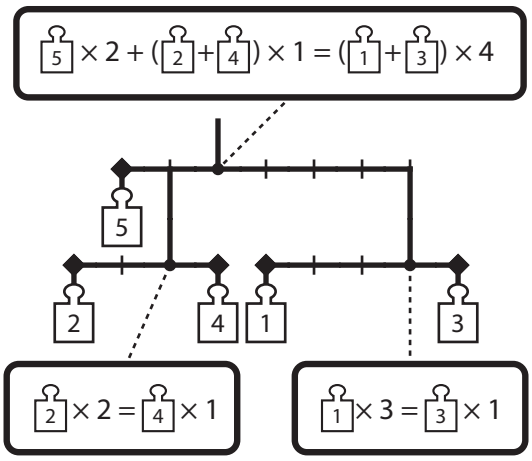
7. Balance [Čedomir Milanović] (54 points)

Attach the given weights to the mobile at the diamond-shaped attach points (one at each point) such that the entire mobile balances. To balance, at each fulcrum (round black dot) the total torque (weight multiplied by distance from the fulcrum) on both sides of the balance must be the same. Ignore any weight of the rods themselves. Weights may be already attached for you.

Answer: Enter the order of the weights, from left to right. (Ignore the height of the weights.) Enter all digits for multi-digit numbers.

Example Answer: 25413



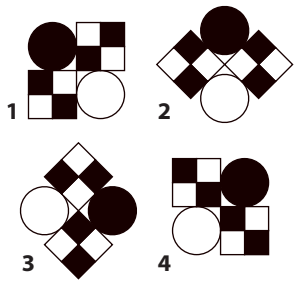


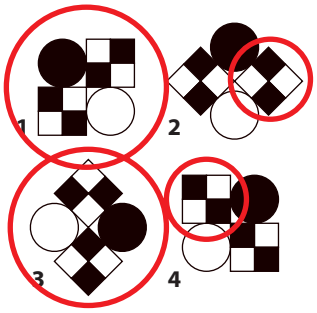
8. Find the Pair [Čedomir Milanović] (22 points)

Two images are identical (except for reflections and rotations). Which two?

Answer: Enter the two numbers corresponding to the two identical images, the smaller number first.

Example Answer: 13





9. Word Search [Čedomir Milanović] (30 points)

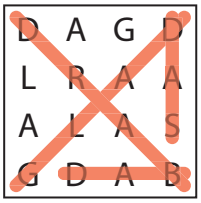
Locate the list of words in the grid. Words always appear in a line in one of the eight standard directions.

Answer: Enter the unused letters in the grid. Enter the rows from top-to-bottom and each row from left-to-right.

Example Answer: AGLA

D	A	G	D
L	R	A	A
A	L	A	S
G	D	A	B

GLAD
SAD
BAD
DRAB



GLAD
SAD
BAD
DRAB

10. Bent Word Search [Čedomir Milanović] (39 points)

Locate the list of words in the grid. Words always appear in a bent line; they start in one of the eight standard directions, bend at right angles at exactly one letter (that is not the first or last letter), and continue in the new direction.

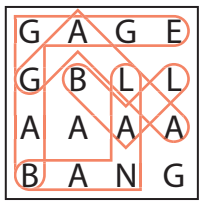
Two words will not be found in the grid.

Answer: Enter the two words that cannot be found in the grid, in alphabetical order.

Example Answer: `ALBA,BANG`

G	A	G	E
G	B	L	L
A	A	A	A
B	A	N	G

ALBA
BAGGAGE
BANAL
BANG
GALA
LAB



ALBA
BAGGAGE
BANAL
BANG
GALA
LAB

11-12. Password Path [Nikola Živanović] (7, 32 points)

Find a path that starts in the upper-left letter and ends in the lower-right letter, that goes through each letter once and repeats only the password (given below the grid). The path may only travel in the eight standard directions and may *not* intersect itself.

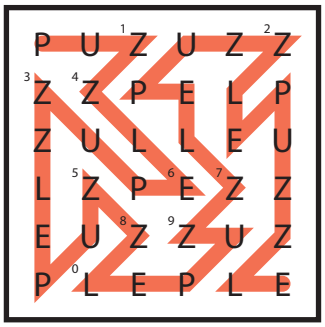
The small digits are only used for entering your answer.

Answer: Enter the order in which the digits appear on the path.

Example Answer: `1463580972`

P	U	1 Z	U	Z	2 Z
3 Z	4 Z	P	E	L	P
Z	U	L	L	E	U
L	5 Z	P	6 E	7 Z	Z
E	U	8 Z	9 Z	U	Z
P	0 L	E	P	L	E

PUZZLE



PUZZLE

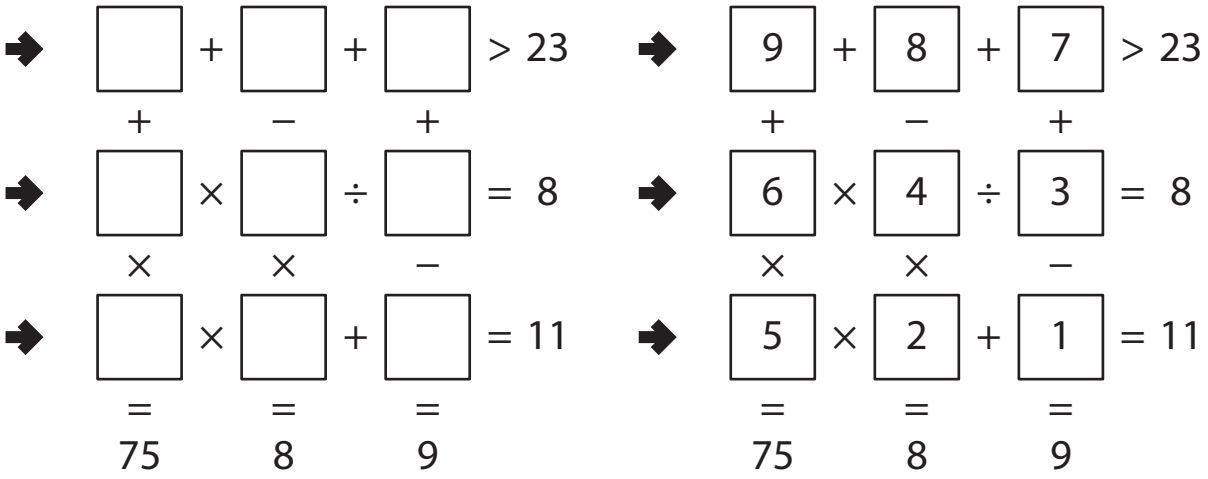
13-14. Arithmetic Square [Nikola Živanović] (7, 26 points)

Place each number 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`



Competitive Section (393 total points)

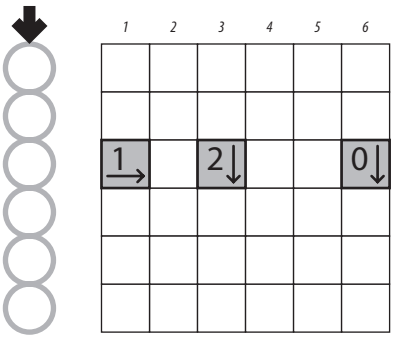
15-17. Yajilin [Nikola Živanović] (3, 17, 30 points)

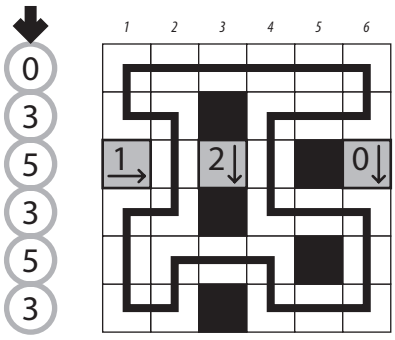
Blacken some white cells and then draw a single closed loop (without intersections or crossings) through all remaining white cells. Loop paths must be orthogonal. Blackened cells cannot share an edge with each other. Some cells are outlined and in gray and cannot be part of the loop. Numbered arrows in such cells indicate the total number of blackened cells that exist in that direction in the grid.

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

Answer: For each row from top to bottom, enter the column number of the left-most blackened cell. (Outlined gray cells are not blackened.) Use only the last digit for two digit numbers; e.g., use '0' for column 10. If none of the cells in a row are blackened, enter '0' for that row.

Example Answer: `035353`





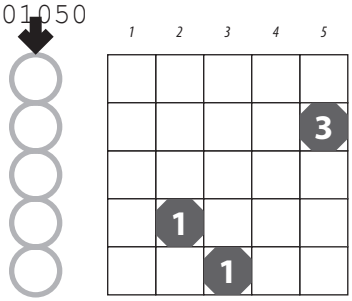
18-20. Lighthouses [Nikola Živanović] (6, 9, 17 points)

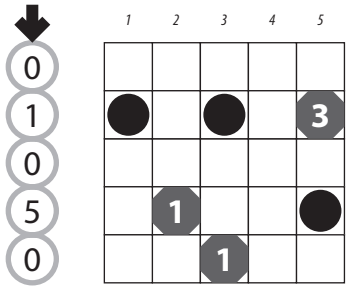
Locate ships in the grid such that each "lighthouse" (clue with a given number) indicates the number of ships in the same row or column as that lighthouse (it "sees through" other lighthouses and other ships). Each ship occupies a single cell and does not touch other ships or lighthouses, not even diagonally.

The number of lighthouses you must locate is NOT provided. The numbers on top of the diagram are for Answer purposes only.

Answer: For each row from top to bottom, enter the number of the first column from the left where a ship appears. Use only the last digit for two-digit numbers; e.g., use '0' if the first ship appears in column 10. If the row is empty, enter '0'.

Example Answer: 01050





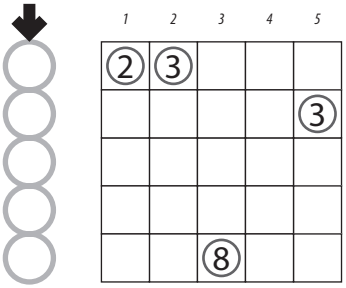
21-23. Kuromasu [Nikola Živanović] (14, 11, 22 points)

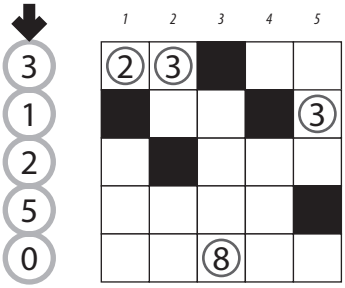
Blacken some cells in the grid such that all numbered cells indicate the total count of non-blackened cells connected in line vertically and horizontally to the numberer cell *including the cell itself*, and that the black cells represent a valid Japanese crossword grid. A valid Japanese crossword grid has all white cells connected edge-wise, and no two black cells connected edge-wise. (Unlike some Japanese crossword grid rules, the corners may be black.)

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

Answer: For each row from top to bottom, enter the number of the first column from the left where a black square appears. Use only the last digit for two-digit numbers; e.g., use '0' if the first ship piece appears in column 10. If the row is empty, enter '0'.

Example Answer: 31250





24-26. Tapa (LITS rules) [Nikola Živanović] (5, 16, 41 points)

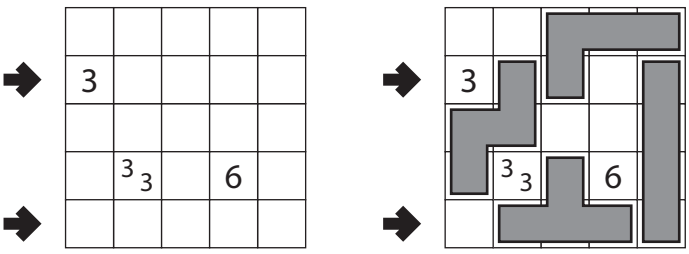
Shade some empty cells black (cells with numbers cannot be shaded). All black cells connect along edges to create a single connected region. (It is permissible for the region to touch itself at a corner, but touching at a corner does not connect the region.) No 2×2 group of squares can be entirely shaded black.

Numbers in a cell indicate the lengths of contiguous black cell groups along the "ring" of (up to) 8 cells touching that cell. (If there is more than one number in a cell, then there must be at least one white (unshaded) cell between the black cell groups.) The numbers are given in *no particular order*. As a special case, if the number given in a cell is a zero (0), it means that none of the cells around that cell may be shaded black.

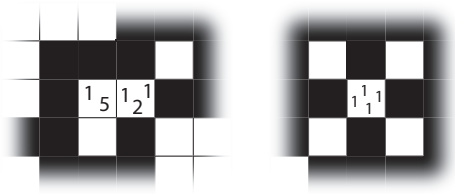
It must be possible to divide the shape of the shaded cells into only tetrominoes such that when two tetrominoes share an edge, they are not of the same shape, regardless of rotations or reflections. (These rules ensure that every tetromino, based on its shape, looks like the letter "L", "I", "T", or "S". Not all four letters have to be present in the grid; for example, it is possible for your solution to not have any "I" shapes.)

Answer: For each designated row, enter its contents from left to right. For each cell, its contents are the letter of the tetromino occupying that cell, or the letter 'X' if the cell is empty (or contains numbers).

Example Answer: XSLXI,XTTTI



Tapa Clue Examples

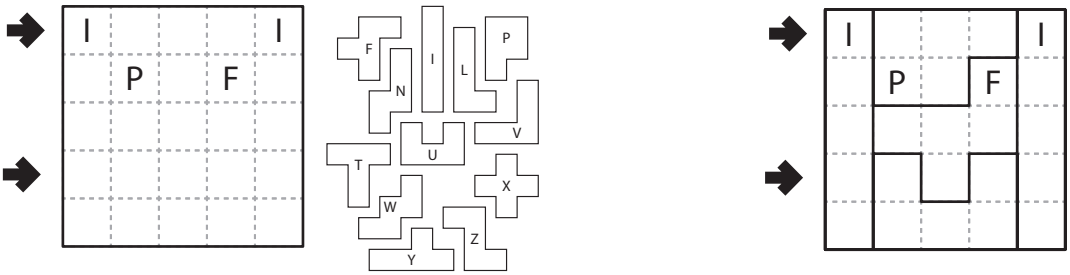


27-29. Pentominous [Nikola Živanović] (16, 12, 34 points)

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.)

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

Example Answer: IPPPI,IUFUI

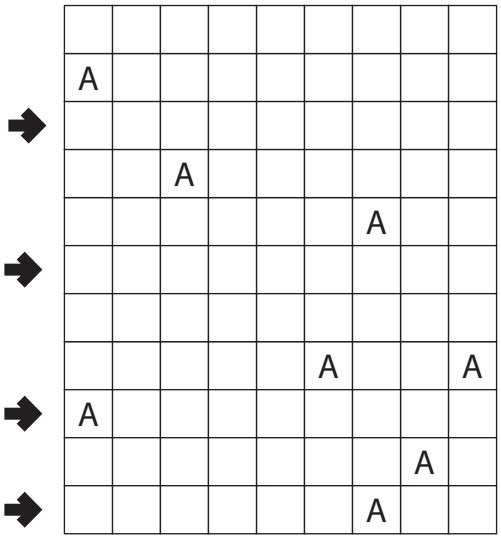


30-32. Scrabble [Čedomir Milanović] (25, 34, 41 points)

Put at most one letter into each cell so that the given words can be read either across (left-to-right) or down (top-to-bottom) in consecutive cells in the grid. Every word must appear in the grid exactly once, and no other words may appear in the grid (that is, if two cells are filled and are adjacent, then there must be a word that uses both of them). Every word must have either a blank cell or the edge of the grid before and after it. All letters must be (orthogonally) connected in a single group.

Answer: For each designated row, enter its contents from left to right, ignoring any blank cells. If all cells in the row are blank, enter a single letter 'X'.

Example Answer: CYPRUSO,ONMUO,AUR,GA

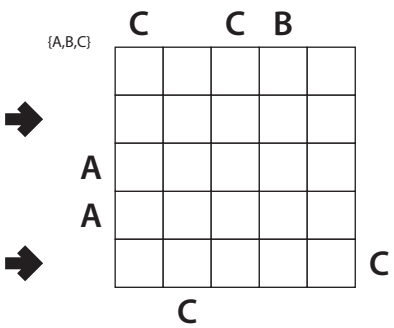
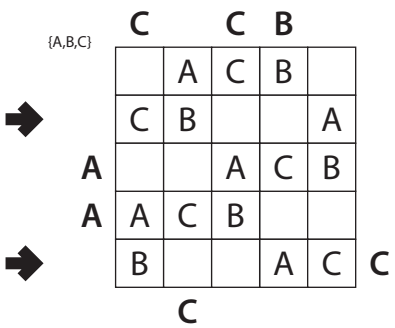


AUSTRIA
CROATIA
CYPRUS
GEORGIA
ICELAND
LUXEMBOURG
MACEDONIA
MOLDOVA
SPAIN

33-34. Easy as... No Touching [Nikola Živanović] (16, 24 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.

Cells that touch diagonally may never share the same letter.

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