WPC French Qualifier 2010 – Instructions

Saturday June 26, 2010

Schedule

10:00–12:00	**Part I - Classics**	120 minutes	675 points + bonus
12:15–12:30	**Part II - Sprint**	15 minutes	75 points + bonus
14:00–14:45	**Part III - Optimizers**	45 minutes	?
15:00–17:00	**Part IV - Remix**	120 minutes	650 points + bonus

Scoring

Points are obtained by solving each puzzle completely and correctly. In Parts 1 and 4, each puzzle has a point value indicated in this instruction booklet. In round 2 (sprint), the number of points earned depends only on the number of puzzles solved correctly.

In Parts 1, 2 and 4, a puzzler who submits correct answers to all puzzles before the end of the round will receive a bonus of 5 points for each remaining full minute.

Part 3 consists of optimizer puzzles: your score will be determined by the quality of your solution, in the manner indicated in the instructions for each puzzle. There are no negative points (a solution that is incorrect or not good enough to earn a positive number of points is worth 0 points). Additionally, for each puzzle in this round, the contestant(s) with the best solution among all participants will earn a bonus of 10 points.

WPC French Qualifier 2010 – Instructions

Part I – 120 minutes – 675 points + time bonus

A puzzler who submits correct answers to all puzzles before the end of this round will receive a bonus of 5 points for each remaining full minute.

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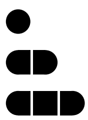
1. Battleships (20 points)

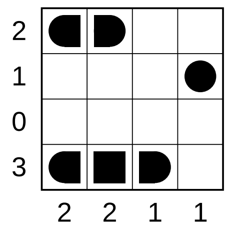
Locate the position of the 10-ship fleet in the grid. The fleet is shown below: one 4-unit battleship, two 3-unit cruisers, three 2-unit destroyers, and four 1-unit submarines. Each segment of a ship occupies a single cell. Ships are oriented either horizontally or vertically, and they do not touch each other, not even diagonally. The numbers on the left and bottom edges of the grid reveal the total number of ship segments that appear in each respective row or column.

Example:
(with a smaller fleet)

2				
1				
0				
3				
	2	2	1	1



Solution:



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2. No Four in a Row (20+20 points)

Fill in the grid with O and X so that four consecutive identical symbols never appear in any row, column, or diagonal.

Example:

		X	X		O	
O						O
			O			O
		O	O	O		
			O	O		
O		O				X
O		O	O			

Solution:

O	X	X	X	O	O	X
O	O	O	X	X	O	O
O	X	X	O	O	X	O
X	X	O	O	O	X	O
O	X	X	O	O	X	X
O	O	O	X	X	O	X
O	X	O	O	O	X	X

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3. Skyscrapers (25+25 points)

The grid represents a group of skyscrapers. Each row and column contains skyscrapers of different heights from 1 to 6 (1 to 4 in the example). The numbers outside the grid indicate how many skyscrapers are visible from that direction (a building located behind a taller one in the same row is completely hidden).

Example:

			1	2	
2					
2					
					3
			3		

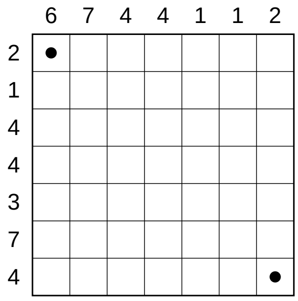
Solution:

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

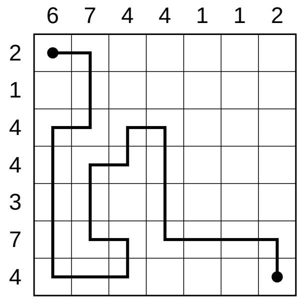
4. Meanders (20 points)

Find a route starting in the top left square and ending in the bottom right square. The route meanders horizontally or vertically, and the numbers outside the grid indicate the number of occupied squares in that row or column.

Example:



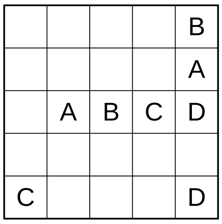
Solution:



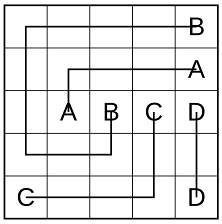
5. ABCD Connection (10+20 points)

Connect each pair of identical letters with an unbroken line. The lines do not intersect or overlap, and pass through the centers of consecutive squares. Every square must be traversed.

Example:



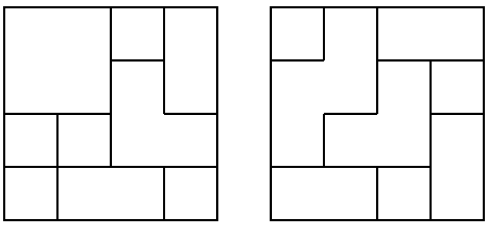
Solution:



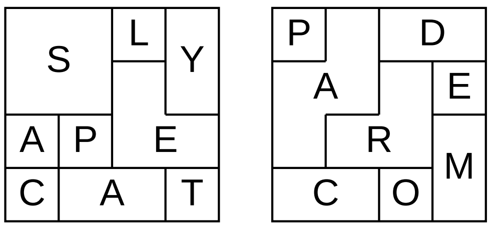
6. Crack It On (20+80 points)

For each puzzle: enter all the given words into the two grids in such a way that each area contains exactly one letter. The words should read across and down in every row and column of each grid.

Example:



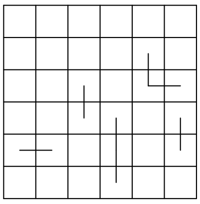
Solution:

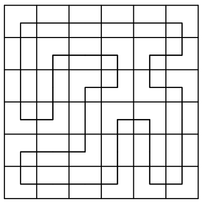


APE	CAT	LEA	SEY
ARC	COM	PAC	SLY
ARE	DEM	PAD	SPA
ARM	DRO	SAC	YET

7. Loop Finder (25 points)

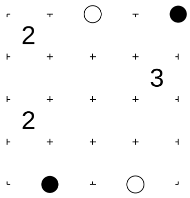
Draw a continuous loop formed by straight line segments connecting the centers of adjacent squares. The loop must not cross or overlap itself, and must visit all squares. Some parts of the loop are already given.

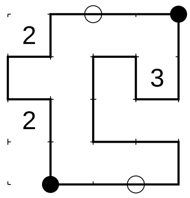
Example: 

Solution: 

8. Masyu Fences (25 points)

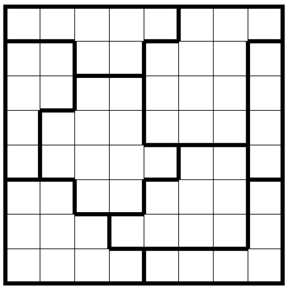
Draw a single closed loop by connecting neighboring points horizontally or vertically. A numbered square indicates exactly how many of its four edges are used by the loop. The path passes through all the circles. When passing through a black circle, the path must make a 90º turn, but cannot turn immediately before or after. When passing through a white circle, the path must go straight and make a 90º turn immediately before and/or after.

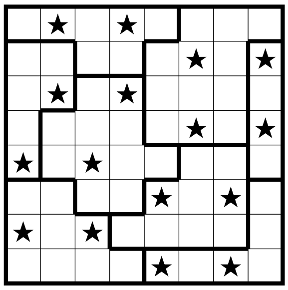
Example: 

Solution: 

9. Star Battle (30 points)

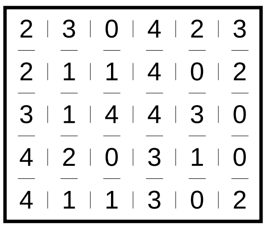
Place two stars in each column, each row, and each black-edged region of the grid. The stars do not touch each other, not even diagonally.

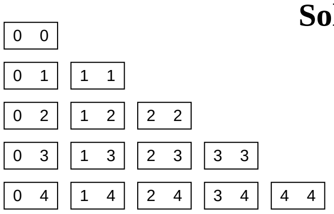
Example: 

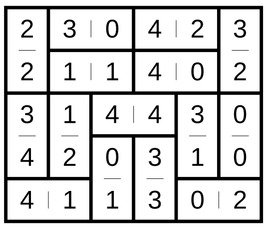
Solution: 

10. Dominos (30+35 points)

A complete domino set (28 dominos from 0-0 to 6-6) [15 dominos from 0-0 to 4-4 in the example] has been placed in the grid. The edges of the dominos have been erased and the dots replaced by numbers. Draw the edges of the dominos in the grid.

Example: 

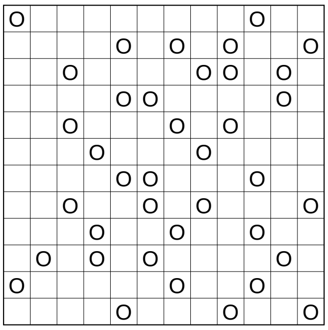


Solution: 

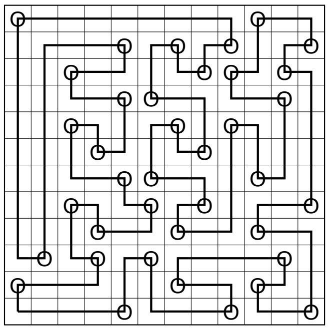
11. Alternate Corners (30 points)

Draw a continuous loop in such a way that every second corner point should be in a square containing a circle. The loop crosses each square exactly once and must not intersect or overlap itself anywhere. The loop must turn when it passes through a square containing a circle.

Example:



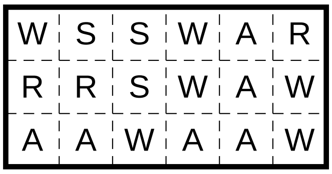
Solution:



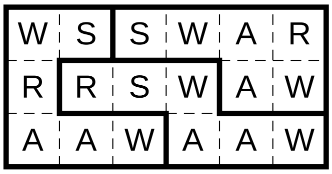
12. WARSAW Partitioner (25 points)

Divide the grid into six-cell regions such that each region contains exactly the letters of the word "WARSAW".

Example:



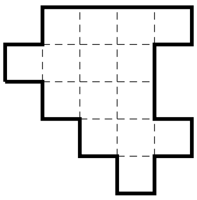
Solution:



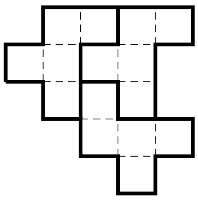
13. Figure Cut (30 points)

Cut the figure into 7 identical pieces [3 in the example]. The pieces may be rotated, but cannot be reflected.

Example:



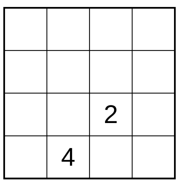
Solution:



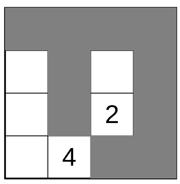
14. Islands (30 points)

The grid consists of white areas (islands), separated by blackened cells which are linked together to form a continuous sea. Each island should contain exactly one of the given numbers, which is equal to its area. The islands may touch each other only diagonally. The sea cannot form any 2x2 square.

Example:



Solution:



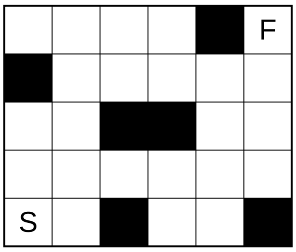
15. Rolling Block Maze (25 points)

Stand a 1x1x2 block vertically on the Start square (S) of the grid. Roll the block on its edges so that it ends up standing vertically on the Finish square (F). The block may not roll so that any part of it is outside the grid or lying on one of the black squares.

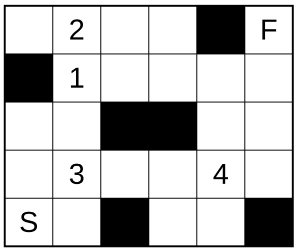
Rolling on an edge means that the axis of rotation is one of the four edges touching the grid, and the block turns 90 degrees about that axis, resulting on a new face lying on the grid.

Find the shortest path from Start to Finish. Mark in the grid the successive positions of the squares on which the block stands vertically, numbered in the order they occur along the path from Start to Finish.

Example:



Solution:



In this example, the sequence of moves – not required as part of the solution – from start to finish is: up, right, up (1), right, up, left (2), down, down (3), right, right (4), up, right, up (F).

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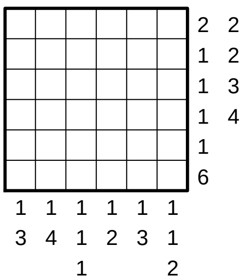
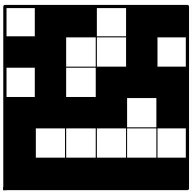
16. Coral Finder (50 points)

Blacken a connected set of squares (the coral) that does not touch itself, not even diagonally, and does not form any closed loops. The numbers outside the grid indicate the lengths of the consecutive parts of the coral in the given row or column. However, the numbers are given in increasing order, not in the order in which they actually appear in the grid. No 2x2 area may be covered by the coral.

Example:



Solution:



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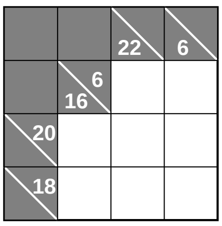
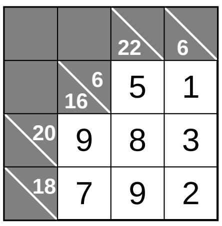
17. Number Crossword (80 points)

Enter digits into the grid (one per square) so that the digits in each series of white squares add up to the number given in the gray-colored cell at the top or to the left. A number above a diagonal bar refers to the digits to be filled in to the right of that cell. A number under a diagonal refers to the digits to be filled in below that cell. The digit 0 is not used, and no digit is ever repeated in a group.

Example:



Solution:



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Part II – 15 minutes – 75 points + time bonus

Scores are determined by the number of puzzles correctly solved within the time limit.

Puzzles solved	0	1	2	3	4	5	6	7	8	9	10
Points	0	5	10	16	23	30	38	46	55	65	75

A puzzler who submits correct answers to all puzzles before the end of this round will receive a bonus of 5 points for each remaining full minute.

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1. Easy as ABC

Place the letters A, B, C into the diagram, so that each letter occurs once in each row and column. The letters outside the diagram indicate the first letter seen from that direction.

Example:

C					B
B					
C					
		B			

Solution:

C		C	A	B	B
	A		B	C	
B	B	A	C		
C	C	B		A	
		B			

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2. All Alone

Black out some of the numbers in the grid so that each row and each column contains only different digits. Black squares must not touch horizontally or vertically, and the remaining squares must all be connected to each other.

Example:

1	2	3	2	5
3	5	5	1	5
1	1	5	3	4
5	3	5	4	1
5	2	1	5	1

Solution:

1		3	2	5
3	5		1	
	1	5	3	4
5	3		4	1
	2	1	5	

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3. Minesweeper

There are 26 [15 in the example] mines hidden in the diagram, at most one in a given square. The numbers inside the diagram indicate the number of mines that can be found in the squares immediately adjacent to that square (horizontally, vertically, or diagonally). Squares with a number do not contain mines.

Example:

			1	2	1
		3		2	
3					
	3	4			1
			5		
			4		

Solution:

●			1	2	1
●	●	3	●	2	●
3	●				
	3	4	●		1
	●	●	5	●	
●	●	●	4	●	●

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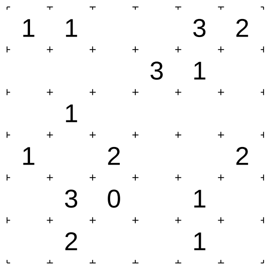
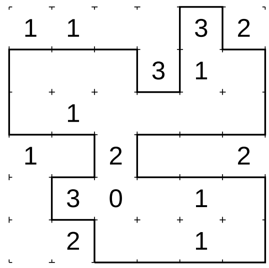
4. Fences

Draw a single continuous loop by connecting neighboring dots horizontally or vertically (but not diagonally). A numbered square indicates exactly how many of its four edges are used by the loop.

Example:



Solution:



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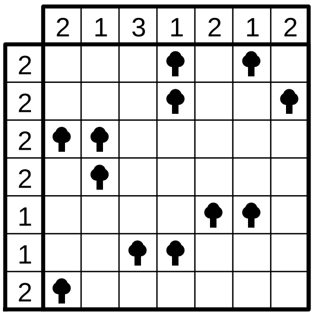
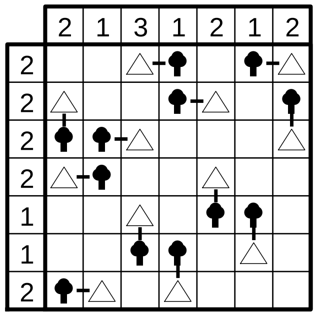
5. Tents

Locate the tents in the grid. Each tree is connected to exactly one tent, found in a horizontally or vertically adjacent square. Tents do not touch each other, not even diagonally. The numbers outside the grid reveal the total number of tents in the corresponding row or column.

Example:



Solution:



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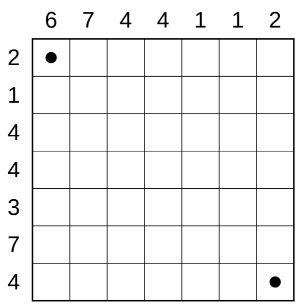
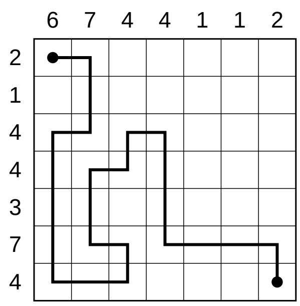
6. Meanders

Find a route starting in the top left square and ending in the bottom right square. The route meanders horizontally or vertically, and the numbers outside the grid indicate the number of occupied squares in that row or column.

Example:



Solution:



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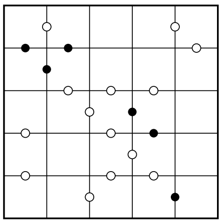
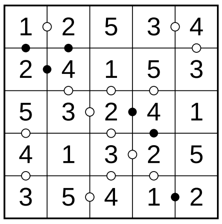
7. Kropki

Fill the table with digits from 1 to 6, so that each digit appears in every row and column exactly once. If the absolute difference between the digits in two adjacent cells equals 1 then they are separated by a white dot. If the digits in two adjacent cells are exactly half of each other then they are separated by a black dot. The dot between adjacent cells containing “1” and “2” can be either white or black.

Example:
(digits 1-5)



Solution:



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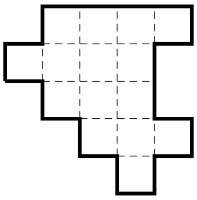
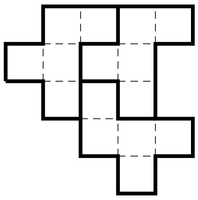
8. Figure Cut

Cut the figure into 6 identical pieces [3 in the example]. The pieces may be rotated, but cannot be reflected.

Example:



Solution:



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9. Subset Sum

Find a subset of the given numbers which add up to exactly 100.

Example: 19 26 43 55

Solution: $\boxed{19}$ $\boxed{26}$ 43 $\boxed{55}$

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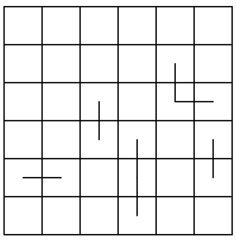
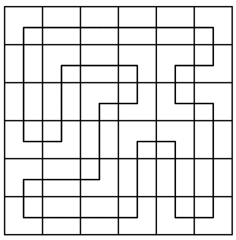
10. Loop Finder

Draw a continuous loop formed by straight line segments connecting the centers of adjacent squares. The loop must not cross or overlap itself, and must visit all squares. Some parts of the loop are already given.

Example:



Solution:



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Part III – 45 minutes

This round consists of optimizer puzzles. For puzzles 1 and 3, you will have enough space to work on two possible solutions, but only one solution will be assigned a score. If you write in both areas, please mark very clearly which one contains your answer – otherwise we will choose one at random, not necessarily the highest scoring one.

For each puzzle, the contestant(s) with the best solution among all participants will earn a bonus of 10 points.

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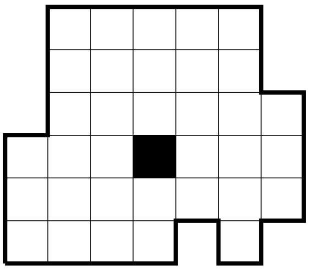
1. Squaring Poland

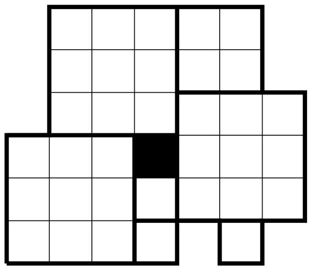
Divide the map of Poland into the fewest number of squares. Your squares must follow the grid lines, and cannot include the black squares (representing the 7 largest cities of Poland).

Score: $5 \times (64 - N)$ where N is the total number of squares used. Any area of the map not divided into squares will be counted as the corresponding number of unit squares.

Example:



Solution ($N = 7$):



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2. Reverse Polish Optimization

Starting from the given ordered list of numbers, perform one of the four elementary arithmetic operations ($+$, $-$, $\times$, $/$) on the last two numbers (in the given order: if the last two numbers are respectively a and b, you can only compute $a + b$, $a - b$, $a \times b$, or a/b). The two numbers are removed from the list, and the result of the operation is inserted in their place. Repeat the process until only one number remains: the final result. The ordering of the numbers cannot be modified at any step in the calculation. Your calculations may involve negative or non-integer values. Your goal is to get a final answer as close to 2010 as possible, but without exceeding 2010. List the arithmetic operations in the order they are to be performed.

Score: $(N - 1900)/2$, where N is your final answer (rounded to the nearest integer), if it is not more than 2010. Your score is 0 if your final answer is less than 1900 or more than 2010.

Example: 20 98 7 3 **Answer:** $/ \ + \ \times$ ($N = 2006.67$)

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3. Celebrity Boggle

Enter letters into the given grid so that names of famous Polish people (among the given list) can be spelled out as on a Boggle board: starting from any square in the grid, by jumping in any of the eight directions to a neighboring square each time. A same letter can be used more than once in the same word. In the given list, only the last names in capital letters matter (the first names are only there for your information). Each name has a certain point value (indicated next to it), and your goal is to maximize the total value of the names that can be read in the grid. (Note: the value of each word is [*information deleted*].)

Score: $N - 75$, where N is the total value of the words that can be read in the grid plus the number of squares left blank in the grid.

Example:

Honoré de BALZAC (6)
Albert CAMUS (5)
Victor HUGO (4)
Emile ZOLA (4)

Solution: ($N = 15$)

O	L	B
Z	A	C
S	U	M

WPC French Qualifier 2010 – Instructions

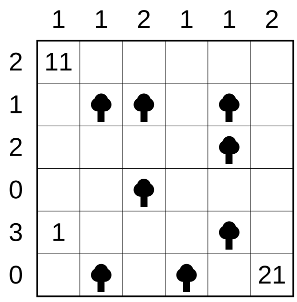
Part IV – 120 minutes – 650 points + time bonus

A puzzler who submits correct answers to all puzzles before the end of this round will receive a bonus of 5 points for each remaining full minute.

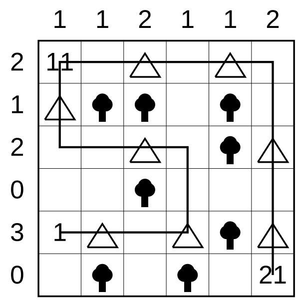
1. Snake in the Tents (45 points)

The grid represents the site of a campground. Each tree is connected to exactly one tent, found in a horizontally or vertically adjacent square. Tents do not touch each other, not even diagonally. The numbers outside the grid reveal the total number of tents in the corresponding row or column. A snake, consisting of 73 sequentially numbered horizontally or vertically connected squares, is hiding in the campground. Squares numbers 1 (the head), 25, 49 and 73 (the tail) are given. The snake does not loop back or touch itself, not even diagonally. The snake passes once through each tent, but it does not pass through any square containing a tree. Locate the tents and the snake.

Example:



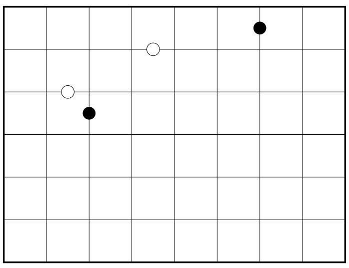
Solution:



2. Word Kropki (40 points)

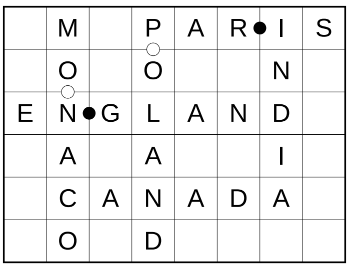
Enter the given words into the grid crisscross style. Words must be formed by consecutive letters, one per square. Words must appear either across, from left to right, or down, from top to bottom. All words must interconnect. A white dot separates two squares whenever they contain letters whose ranks in the alphabet differ by 1. A black dot separates two squares whenever they contain letters whose ranks in the alphabet are exactly half of each other. The dot between adjacent squares containing “A” and “B” can be either white or black.

Example:



CANADA MONACO
ENGLAND PARIS
INDIA POLAND

Solution:

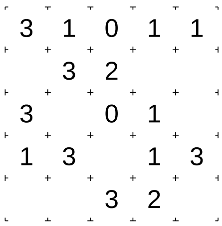


3. All Alone Fences (30+45 points)

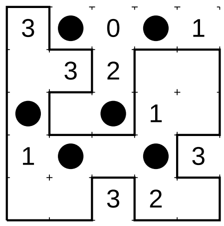
Black out some of the numbers in the grid so that each row and each column contains only different digits. Blackened clues must not touch horizontally or vertically, and the remaining squares must all be connected to each other.

Then, draw a single closed loop by connecting neighboring points horizontally or vertically. Each numbered square indicates how many of its four edges are used by the loop.

Example:



Solution:



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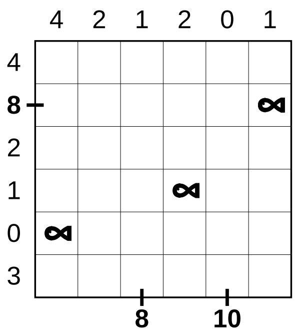
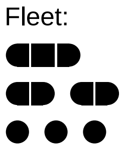
4. Battleships and Anglers (40+100 points)

The grid represents a lake, in which the given battleship fleet is hidden. Ships are oriented either horizontally or vertically, and they do not touch each other, not even diagonally. The non-bold numbers outside the grid indicate how many ship segments lie in a given row or column. There are no ship segments in the cells that contain fish.

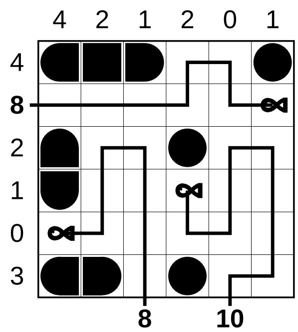
Anglers are standing around the lake, at each position with a bold number. Each angler catches one fish. Their fishlines always connect the centers of adjacent squares, and do not intersect. The numbers indicate the number of squares traversed by each fishline. The fishlines cannot pass through the cells occupied by battleship segments. Every cell of the grid is occupied by either a battleship segment or a fishline.

Example:





Solution:



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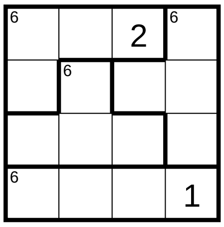
5. Killer Minesweeper Star Battle (70 points)

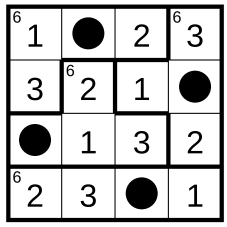
Place two stars in each column and each row of the grid. Each highlighted region contains exactly one star. The stars do not touch each other, not even diagonally. The digits given in the grid indicate how many stars can be found among the eight neighboring squares.

Then, fill the unoccupied cells with digits from 1 to 7, in such a way that each digit appears once in each column and in each row. Within each highlighted region, the digits are all different and their sum equals the given number.

Example with digits 1-3 and one star per row/column:



Solution:

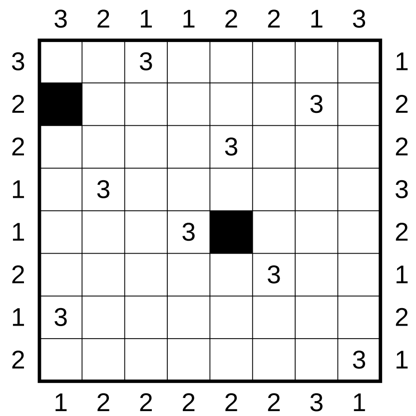


6. Pentamino Island Skyscrapers (80 points)

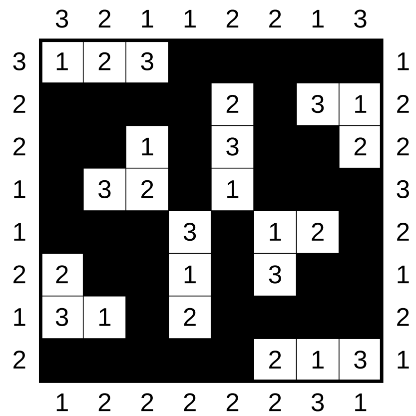
The grid consists of white areas (islands), surrounded by blackened cells which are linked together to form a continuous sea. Each island should contain exactly one of the given numbers, which is equal to its area. The islands may touch each other only diagonally. The sea cannot form any 2x2 square.

Each island is built up with skyscrapers, one in each square, all of different heights ranging between 1 and 5. Each value from 1 to 5 appears exactly once in each row and in each column of the grid. The numbers outside the grid indicate the number of buildings that can be seen by an observer looking into the grid from the corresponding direction, taking into account that higher buildings block the view of lower buildings from the observer.

Example with heights 1 to 3:
In this example the sea can form 2x2 squares.



Solution:



7. Japanese Magnetic Domino Cross-Sum Battleships (200 points)

The given battleship fleet is hidden in the grid. Ships are oriented either horizontally or vertically, and they do not touch each other, not even diagonally. The remaining cells are occupied by dominoes. Each domino from the given set appears exactly once. Moreover, each domino is a magnetic plate, consisting of one positive half and one negative half. Halves with the same polarity cannot touch each other horizontally or vertically. The numbers to the right of the grid and below it indicate the number of magnetic halves in that particular row or column.

Finally, the sums of the numbers (with signs given by their polarity) in each consecutive group of magnetic halves are given, in order (left-to-right and top-to-bottom). No digit can be repeated within a row or column (irrespective of polarity). The sums in the across direction are given sequentially starting with the first row, then the second row, and so on until the last row. The sums in the down direction are given sequentially starting with the first column, then the second column, and so on until the last column.

Partial credit: 60 points will be given for the correct location of the battleship fleet.

Example:

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

Fleet:

1 2

1 3 2 3

1 4 2 4 3 4

Across: -2, -1, 4, 5

Down: 1, 3, -2, 3, 4, -4, 1

Solution: