THE THIRD OPEN SERBIAN OPTIMIZING PUZZLE CHAMPIONSHIP
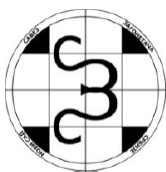
29. NOVEMBER - 12. DECEMBER 2010.
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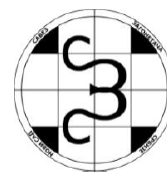
SECOND WEEK
(6.12. - 12.12.)

7. SUDOKU BLACKJACK

8. PENTOMINO CROSSWORD

9. CHESS DOMINO

10. FOUR EXPRESSIONS

11. FILLOMINO 123

12. ROTATING CUBOID

7. SUDOKU BLACKJACK

Fill in the grid the numbers from 1 to 9 so that each number appears once in each row, column and 3x3 region. The aim is to obtain as many sequences whose sum is 21. A sequence is formed of adjacent numbers belongig to the same row, column or a diagonal. A number may be used in more than one sequence.

Scoring: Each sequence whose sum is 21 is worth 1 point. A sequence that passes through all three colours (red, blue and white - Serbian flag colours) is worth 2 points. Maximize your score.

	A	B	C	D	E	F	G	H	I
J									
K		3							
L									
M									
N					3				
O									
P									
Q								3	
R									

Example (on smaller grid):

	A	B	C	D	E	F
G	2	7	9	5	3	4
H	6	5	8	9	1	2
I	1	3	4	6	8	7

Answer format: First write your score, followed by the content of the grid, left to right, top to bottom, followed by the coordinates of the initial cell of each sequence. For the given example, the answer would be: *6; 279534, 658912, 134687; BG, BG, CG, CG, BI, DI.*
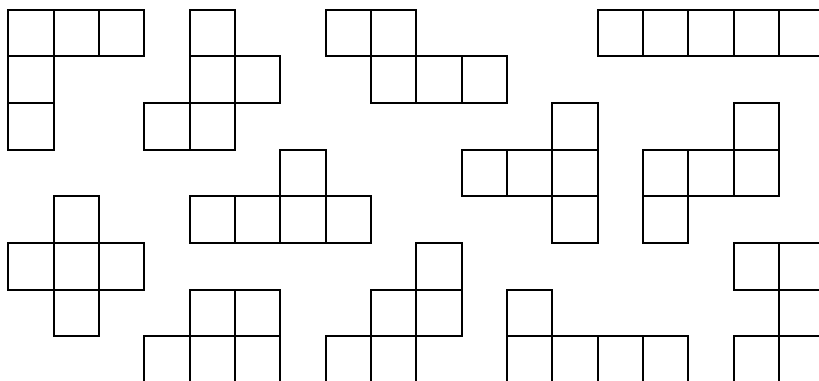
8. PENTOMINO CROSSWORD

Make a grid of any size you choose and fill in some of the words form the list below (the year 2010 has been declared the International Year of Biodiversity) in standard criss-cross style. Then place all 12 pentominoes in such a way that they do not touch, not even diagonally. Each pentomino must be filled with letters, i.e. must contain 5 letters from the crossword. The pentominoes may be rotated and reflected.

Scoring: Each used word from the list is worth 1 point and each letter outside the pentominoes is worth 1 point. Each letter that appears more than once outside the pentominoes is worth 3 points for each additional appearance (e.g. if the letter "A" appears three times outside the pentominoes, you get 6 additional points). **Mimimize** your score.

Example (smaller grid with 3 pentominoes):

AARDVARK	LION
ALLIGATOR	MAPLE
ANT	MILFOIL
APPLE	MONKEY
BANANA	NETTLE
BEAR	NIGHTSHADE
BINDWEED	OAK
BIRCH	OKAPI
BISON	ONION
BLACKBERRY	ORANGE
BOXWOOD	PANTHER
BUTTERFLY	PIGEON
CABBAGE	PINE
CAMEL	PLANTAIN
CARROT	POPLAR
CHERRY	RABBIT
CORNEL	RASPBERRY
COYOTE	RAVEN
DAISY	ROSE
DEER	SNAKE
EAGLE	SNOWDROP
ELEPHANT	SPIDER
FROG	STRAWBERRY
GARLIC	TIGER
GIRAFFE	TULIP
JACKAL	TURKEY
JAGUAR	WALNUT
KANGAROO	WILLOW
LEOPARD	WOLF
LILAC	ZEBRA

7 words have been used, and there are 8 letters outside the pentominoes. The letter "N" appears twice so it is worth 3 additional points. The score is 7+8+3=18.
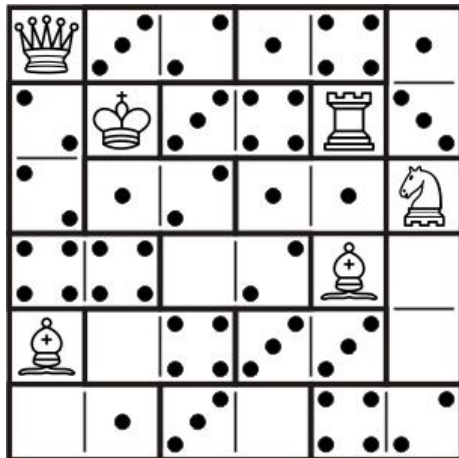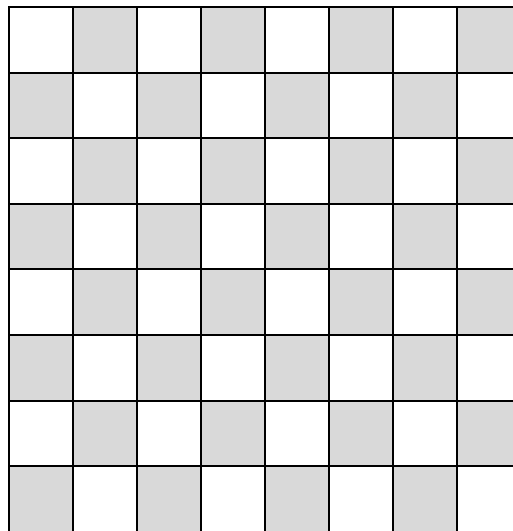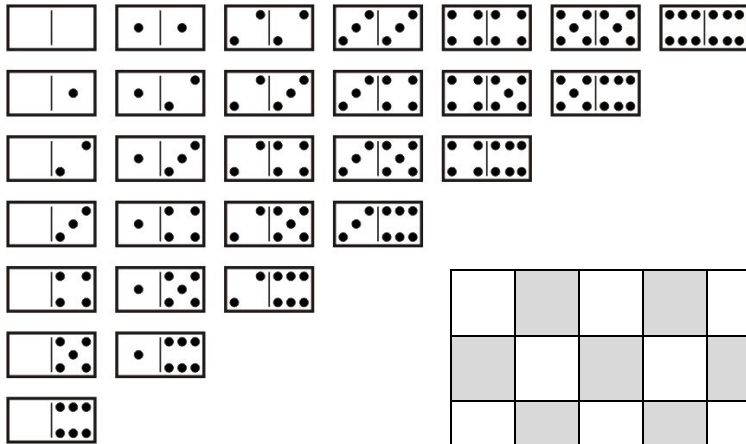

Answer format: First write your score, followed by the grid size, followed by its content, left to righht, top to bottom. Use "x" for empty cells. For the given example, the answer would be: *18; 8x6; xxxOxxBx, xxRABBIT, SNAKExRx, xxVxAxOx, xDEERxNx, xxNxxxxx.*

9. CHESS DOMINO

Place the given domino set and eight chess pieces: the king (K), the queen (Q), two rooks (R), two knights (N) and two bishops (B) on the chessboard so that each square is occupied.

Scoring: Each correct square (that is attacked as many times as its the domino number shows) is worth 1 point. If a piece attacks only correct squares, it is worth additional 5 points. Maximize your score.

Example (smaller board with 6 pieces):

There are 17 correct squares and the king attacks only correct squares. The score is 17+5=22.

Answer format: First write your score, followed by the content of the board, left to right, top to bottom. Put horizontal dominoes in the brackets. For the given example, the anser would be: *22; Q(32)(14)1, 2K(34)R3, 2(12)(11)N, (44)(02)B0, B(04)(33)0, (01)(30)(42).*

10. FOUR EXPRESSIONS

Place numbers from 1 to 9 in each expression. Each number can be used once per expression. All relation signs (>, <. =) must be satisfied.

Scoring: Minimize the difference between the highest and the lowest expression values.

Example (1-5):

| 1 | 5 | 4 | : | 2 | + | 3 | = | 80 |

| 4 | x | 2 | 1 | - | 5 | - | 3 | = | 76 |

| 5 | x | 4 | x | 3 | + | 2 | 1 | = | 81 |

| 2 | x | (| 5 | 3 | - | 1 | 4 |) | = | 78 |

Answer format: First write your score, followed by the numbers row by row. For the given example, the answer woul be: *5; 15423, 42153, 54321, 25314.*

11. FILLOMINO 123

Divide the given grid into some areas of one, two or three squares. Each area contains the numbers that show its size. Two areas of same size may touch only diagonally. All unused cells must be blackened. Дату мрежу испуните областима површине од једног до три квадратића. Start from any square with "1" and follow the path that goes 1-2-3-1-2-3-1... and does not cross or overlap itself. Each square may be used only once. The path cannot go through black cells.

Scoring: The score is equal to P-3B, where P is the path length, and B is the number of black cells. Maximize your score.

Example(on smaller grid):

The path length is 18.
The score is 18-2x3=12.

Answer format: First write your score, followed by the content of the grid, left to right, top to bottom., followed by the coordinates of the initial and final cell of the path. Use "x" for black cells. For the given example, the answer would be: *12; A2-E5: x33122, 123233, 321231, 332122, 212333, 2x1221.*

12. ROTATING CUBOID

Choose a cell (initial square) form the grid below and place a cuboid of the size 3x1x1 "standing up". The red square is not allowed to be initial. Then rotate the cuboid so that it "falls down" and covers 3 cells from the grid. **Add** the numbers on those three cells. Then rotate it over a long edge and **subtract** the three numbers covered. After that rotate the cuboid over a short edge (stand it up), and the first move is finished.

	1	2	3	4	5	6	7	8	9	10	11
A	8	3	0	-5	-1	4	9	3	-7	3	-7
B	1	-6	9	1	7	5	3	-8	2	4	2
C	-3	0	4	-1	4	6	-2	-1	-6	-1	4
D	-2	3	6	0	-7	-3	5	9	0	-5	3
E	1	1	-1	2	5	7	-3	1	8	6	4
F	-3	9	3	-7	6	-4	5	-2	-7	3	-9
G	4	1	-9	5	3	8	-3	9	0	-5	-5
H	6	-5	2	-3	-1	0	2	4	1	5	4
I	0	7	-7	-6	6	-5	-2	0	-4	0	3
J	-5	-5	2	9	-1	0	2	4	1	7	4
K	-6	7	-7	3	6	-5	-2	0	-4	0	5

Scoring: Make **14** such moves and maximize their sum. Each cell may be used at most once in the "standing up" position, but more than once when "lying down". The only exception to this rule is the initial square which may also be used as a final one, which brings **25** points bonus. If an orange square is occupied by the cuboid (either "standing up" or "lying down"), it brings **10** points bonus. This bonus can be used only once for each orange square.

Example (smaller grid with 7 moves):

	1	2	3	4	5	6	7	8	9
A	7	3	0	-5	-1	4	9	3	-7
B	4	-6	7	1	9	5	3	-8	2
C	-3	0	4	-1	4	6	-2	-1	4
D	-2	3	6	0	-7	-3	5	9	0
E	1	1	-1	8	5	7	-3	1	4
F	-3	9	3	-7	6	-2	5	-2	-9
G	4	1	-9	0	3	8	-3	9	-5
H	6	-5	2	1	-1	0	2	4	4
I	8	7	-7	-4	6	-5	-2	0	3

initial square: B2   final square: F7

score:
(7+1+9)-(0-5-1)+(9+3-7)-(3-8+2)+(6-3+7)-(-2+5-3)+(5+9+1)-(-5-1+4)+(7+4+6)-(-6+0+3)+(-1+8+5)-(3-7+6)+(8+0-5)-(-3+2-2)=94
final score: 94+2x10+0=114

Answer format: First write your score, followed by the coordinates fo the initial square, followed by all the moves chronologically by writing the coordinates of the square on which the cuboid is "standing up" and the directions of the rotation (U, D, L, or R). For the given example, the answer would be: *114; B2,RU,A6,RD,B6,DR,B7,LU,A3,DL,E2,RD,F6,DR,F7.*