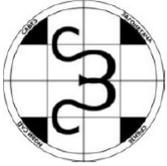


# THE EIGHTH SERBIAN OPEN CHAMPIONSHIP IN SOLVING OPTIMIZING PUZZLES



December 18th - 28th 2015

<http://puzzleserbia.rs/>



1. KVIZOVKA
2. MASYU
3. FOUR CONSECUTIVE TOUCHING PENTOMINOES
4. THE LINK

Send your solutions together with your info (name, city, country) to [answers@puzzleserbia.rs](mailto:answers@puzzleserbia.rs) and, just in case, also to [puzzleserbia@gmail.com](mailto:puzzleserbia@gmail.com) since last year some servers experienced problems with the first e-mail address. You may send them as many times as you want, however, only your last solution counts. We wish you good luck!

# BASIC RULES

There are four puzzles. For each puzzle the scoring will be the following:

The best competitor gets 25 points, the second best 20 points, the third best 17, the fourth best 15, then 14, 13, 12, 11, ..., 2, 1. Each subsequent competitor with a correct solution will get 1 point. Incorrect solutions will score 0 points. In case of tie where two or more competitors have the same score they will get the same amount of points according to their place on the standings, however the competitors behind them will have their scores as if no tie happened. For example, if the third, fourth and fifth best competitor have the same score, they will all get 17 points, while the sixth best will still get 13 points.

Each puzzle is scored separately, so the possible maximum is 100 points. However, keep in mind while solving that the puzzles are linked through Puzzle 4.

# THE PUZZLES

Puzzles 1-3 are all solved on the 17×17 size grid below. The grids are given at the end of this document for your convenience. Puzzle 4 links the grids of Puzzles 1-3.

## **Puzzle 1: KVIZOVKA<sup>1</sup>**

Place in the grid some words and phrases from the list below. Each word can be used at most once. The words must appear either across or down. Each word must be bounded by two black cells, one placed in front of its first, and the other behind its last letter (if not already bounded by the end of the grid). Other black cells are not allowed. All the words must be interconnected. The phrases consisting of two or more words (connected with “-” for convenience) should be written as one word.

**word list:** AFFAIR, ALL, ALLOW, AMONTILLADO, ANNEX, ANNUAL, APPLAUSE, APPLE, ARROWWOOD, ASCII-IMPORTER, ATTIC, BUFFET, BULL, BUNN, BUTTON, BUZZ, CALL, CANNIBAL, CAYENNE, CELL, CLAW-WAY, CLIFF, COMPLEX-X, CONTINUUM, COPPER, CPU-USAGE, CUBBYYEW, CUP-PLATE, CUT-THROUGH, DIFFERENCE, DIZZINESS, DRY-YEAST, EFFICIENCY, EVEN-NUMBER, EXXON, FENNEL, FIXX, FLAT-TV, FLIVVER, FOLLY, FULL, GET-TOGETHER, GIVEN-NAME, GRIZZLY, HAPPY, HAT-TRICK, HEMP-PLANT, HIPPIE, HOT-TOPIC, ILL, ILLUSION, INN, INSTALL, INTERMEZZO, JAZZ, LATTICE, LIP-PLUMPER, LITTLE, LOAN-NOTE, LUV-VIRUS, LUVVIE, MILLENNIUM, MINNOW, NOW-WHAT, NUNN, NUTGALL, OFF, OFFICER, ONLY-YOU, PENNY, PILL, PILLOW, PIZZERIA, PLAY-YARD, PULL-LEFT, PUPPY, PUTT, PUZZLE, QUARTZ-ZINC, QUASI-IPSATIVE, RAIL-LINE, REAL-LIFE, RESIDUUM, ROOF-FRAME, RUFFIAN, SAVVY, SCREWWORM, SELF-FEEDING, SHUTTLE, SKIING, SLIPPY, SLOWWORM, SOFTBALL, STILL, SUFFIX, SUNNY, SUPPLY, TANK-BLITZ-ZERO, TARTUFFE, TAXIING, TOP-PLAYER, TV-VILLAIN, TWITTER, TYPP, TYRANNY, VACUUM, VEXILLOLOGY, VIGNETTE, VOLLEY, WAFFLE, WATERPROOF-FABRIC, WATT, WAVEOFF, WAXBILL, WILL, WILLOWWARE, WINDOWWISE, YEAR-BY-YEAR, YUPPIE, ZAXXON, ZEPPELIN, ZILL, ZIPPER, ZOMBIISM

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<sup>1</sup> A game similar to scrabble

Scoring: Each used word is worth 1 point and each letter where two words intersect is worth 1 point. In the process there may appear other words in the grid that are not on the list but they are not worth any points even if they mean something. Maximize your score.

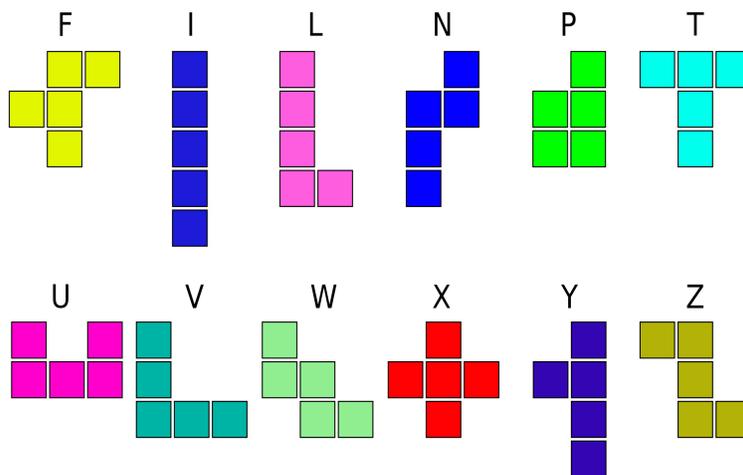
### Puzzle 2: MASYU

Draw a closed loop in the grid that goes horizontally and vertically connecting the centers of the cells. The loop may not touch, cross or overlap itself. Then place some black and white circles so that they satisfy standard Masyu rules; in the cells with black circles the loop turns, but does not turn in two adjacent cells, while in the cells with white circles the loop does not turn, but turns in at least one of two adjacent cells. Not all possible circles need to be placed.

Scoring: Let X be the number of the circles and Y the number of loop segments between consecutive circles of the opposite colour that go through at least 3 cells. Maximize the product  $X \times Y$ .

### Puzzle 3: FOUR CONSECUTIVE TOUCHING PENTOMINOES

Fill in the grid pentominoes such that there is no space left for more pentominoes. Pentominoes can be rotated and reflected, but they cannot overlap. Each pentomino may be used as many times as desired. The set of pentominoes is given on the image below. A standard letter is assigned to each pentomino. Consider the cyclic sequence of “pentomino” letters ...FILNPTUVWXYZFIL... We say that four pentominoes are consecutive if their letters are consecutive in this sequence (e.g. UVWX).



Scoring: Each grid point that touches four consecutive pentominoes is worth 3 points when the combination appears for the first time and 1 point for each subsequent occurrence. Let A be the total points obtained this way and B the number of placed pentominoes. Maximize the product  $A \times B$ .

## **Puzzle 4: THE LINK**

This puzzle links the previous three puzzles.

Scoring: Each black cell in the grid of Puzzle 1 such that in the cell with the same coordinates in the grid of Puzzle 2 lies a circle is worth 2 points. Each blank cell in the grid of Puzzle 2 such that in the cell with the same coordinates in the grid of Puzzle 3 is also blank is worth 1 point. Each cell with a letter in the grid of Puzzle 1 such that in the cell with the same coordinates in the grid of Puzzle 3 there is a pentomino with the same letter is worth 1 point. Maximize the total points.

### ANSWER FORMAT

For each puzzle write your final score and its summands/factors (e.g. in Puzzle 2 write the number of circles and the number of segments). You can submit the grids of the first three puzzles in one of two following ways:

1. Clear and legible images of the three grids (scanned or otherwise made).
2. Plain text format:

Puzzle 1: The content of the grid, row by row, top to bottom. Use capitals for intersections letters and small for others, “#” for black cells and “.” for blank cells.

Puzzle 2: The content of the grid (the loop), row by row, top to bottom. Use “h” for the cells where the loop goes straight horizontally, “v” where it goes straight vertically, “u” for “up and left” turn, “r” for “up and right” turn, “d” for “down and right” turn, “l” for “down and left” turn and “.” for blank cells. Then write the coordinates of black circles in alphabetical order, followed by the coordinates of the white circles in the alphabetical order.

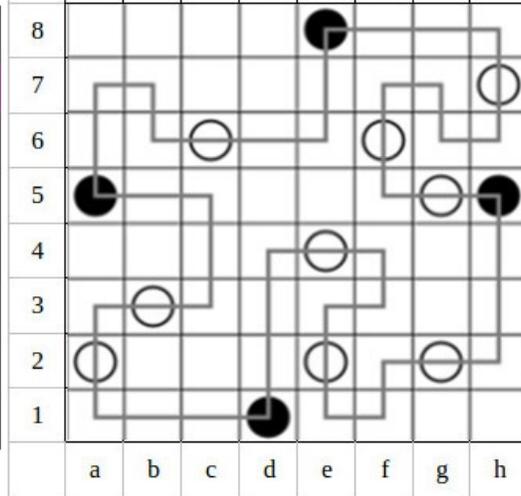
Puzzle 3: The content of the grid, row by row, top to bottom. Use the corresponding pentomino letters (capitals where the touching of four pentominoes occurs and small for others) and “.” for blank cells.

## EXAMPLE on smaller grid:

Puzzle 1:

8	S			2	I	N	N	
7	T	Y	P	P			U	
6	I	L	L	U	S	O	N	
5	L	I	T	T	L	E	2	N
4	L	A	T	T	I	C	E	
3					P	I	L	L
2	2	P	U	P	P	Y	2	
1	P	E	N	N	Y			
	a	b	c	d	e	f	g	h

Puzzle 2:



Puzzle 3:

8	1	1	1	1				
7					W	U		
6					V	X		
5								
4	1	T	V		V	U		
3		U	P		P	T	1	
2								
1							1	1
	a	b	c	d	e	f	g	h

Answers:

**Puzzle 1:** 28=12+16 (words + intersections)

```
s..##inN
TypP#..u
IllUSioN
LitTLe#n
LatTIce#
#..#Pill
#pupPy#.
PennY#..
```

The intersections are shown with large letters.

**Puzzle 3:** 77=7×11 (points × pentominoes)

```
....wuuu
vvvwWUxu
vtwwVXxx
vtttvuxu
.TVvVUuu
uUPpPT..
unnppptt
uunnnt..
```

The points are marked with four letters around it.

**Puzzle 2:** 91=13×7 (circles × segments)

```
....dhh1
dl..vdlv
vrhhuvru
rh1..rh1
..vdhl.v
dhuvdu.v
v..vvdhu
rhhuru..
```

a5,d1,e8,h5; a2,b3,c6,e2,e4,f6,g2,g5,h7.

**Puzzle 4:** 24=8+8+8

- 4 black cells in grid 1 that match circles in grid 2 (marked with "2" in grid 1, each worth 2 points);
- 8 blank cells in grid 3 that match 8 blank cells in grid 2 (marked with "1" in grid 3, each worth 1 point);
- 8 letters in grid 1 that match pentominoes in grid 3 (marked with corresponding colours in grid 1, each worth 1 point)

17																	
16																	
15																	
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9																	
8																	
7																	
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	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q

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