



WPF PUZZLE GP 2022 COMPETITION BOOKLET

Host Country: Turkey

Salih Alan, Ferhat Çalapkulu

Special Notes: None.

1. Arithmetic Square (Unknowns) [Ferhat Çalapkulu] (17 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).

Some numbers have been replaced with question marks; these numbers must be integers (and can be negative or zero).

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: 978, 624, 531

$$\begin{array}{l} \rightarrow \begin{array}{c} \boxed{9} + \boxed{7} + \boxed{8} > 23 \\ + \quad - \quad + \end{array} \\ \rightarrow \begin{array}{c} \boxed{6} \times \boxed{2} \div \boxed{4} = ? \\ \times \quad \times \quad - \end{array} \\ \rightarrow \begin{array}{c} \boxed{5} - \boxed{3} - \boxed{1} = ? \\ = \quad = \quad = \\ 75 \quad ? \quad 11 \end{array} \end{array}$$

$$\begin{array}{l} \text{1a} \rightarrow \begin{array}{c} \boxed{} + \boxed{} \times \boxed{} = 20 \\ + \quad + \quad + \end{array} \\ \text{1b} \rightarrow \begin{array}{c} \boxed{} + \boxed{} + \boxed{} = 21 \\ + \quad \times \quad + \end{array} \\ \text{1c} \rightarrow \begin{array}{c} \boxed{} + \boxed{} + \boxed{} = ? \\ = \quad = \quad = \\ 20 \quad 21 \quad ? \end{array} \end{array}$$



2. Skyscrapers (Sum) [Ferhat Çalapkulu] (26 points)

Place a number from 1 to X (integers only) into each cell so that each number appears exactly once in each row and column. (X is the number of cells in each row.) Each number represents a skyscraper of its respective height. The numbers outside the grid indicate the sum of the heights of the skyscrapers that can be seen in the respective row or column from the respective direction; smaller skyscrapers are hidden behind higher ones. Some numbers may already be filled in for you.

Answer: For each designated row, enter its contents. Do not include any numbers outside the grid.

Example Answer: 3214, 2341

		4				
5	1	4	2	3	7	
→	3	2	1	4		
	4	1	3	2		
→ 9	2	3	4	1		
						7

8

2a →

16

15

2b →

18 17

10

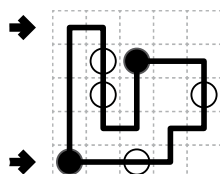
12

3. Masyu [Salih Alan] (11 points)

Draw a single loop that passes orthogonally through centers of cells. The loop must go through all circled cells. The loop may not intersect itself or enter the same cell more than once. The loop must go straight through the cells with white circles, with a turn in at least one of the cells immediately before or after each white circle. The loop must make a turn in all the black circles, but must go straight in both cells immediately before and after each black circle.

Answer: For each designated row, enter the letter for each cell, from left to right. The letter for a cell is 'I' if the path goes straight through the cell, 'L' if the path turns in the cell, and 'X' if the path does not go through the cell. You may use other letters or numbers, as long as they are distinct.

Example Answer: LLXXX, LIILX



3a →

3b →

	●	●	○	●		○	●	○
	○	○				○		
	○				●			●
	●				○	●	●	○
					●		○	
●	○	●	○					
○	●		●			○		○
			○				●	●
							●	
		○	●			○	●	○
	○	●			●	○		

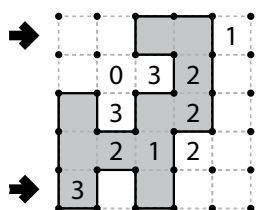


4. Slitherlink [Ferhat Çalapkulu] (15 points)

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.

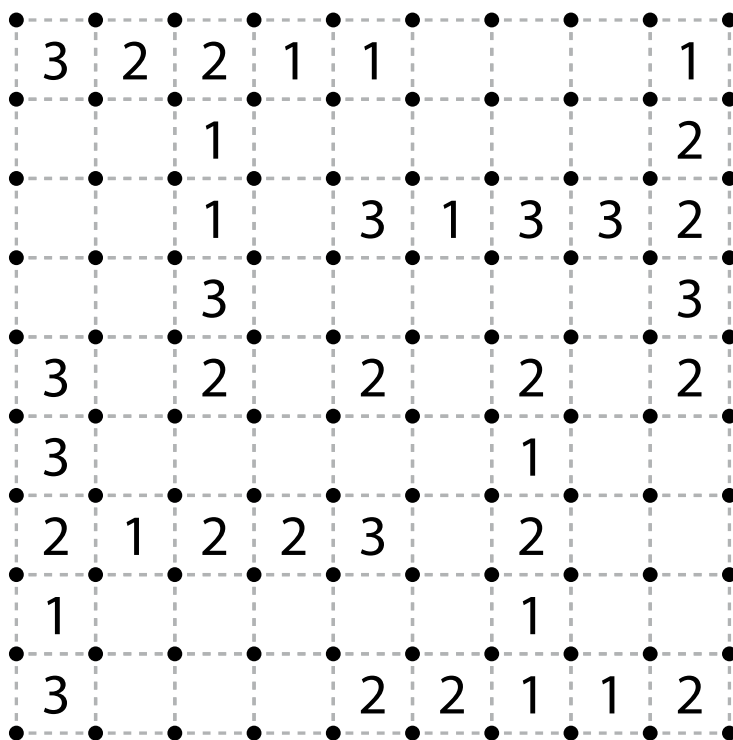
Answer: For each designated row, enter its contents from left-to-right. Use 'o' for a cell inside the loop and 'x' for a cell outside the loop. You may use two other characters, as long as they are distinct.

Example Answer: XXOOX, OXOXX



4a →

4b →



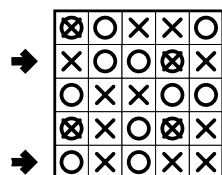
5. No Four in A Row [Salih Alan] (31 points)

Place a circle or a cross into each empty cell, one symbol per empty cell, such that no row, column, or diagonal has four consecutive cells with the same symbol. Some cells have already been filled for you; it is possible for already-filled-in cells to contain both a circle and a cross.

Answer: For each designated row, enter its contents from left to right. Use 'o' for a cell occupied by a circle, 'x' for a cell occupied by a cross, and '2' for a cell occupied by a circle and a cross.

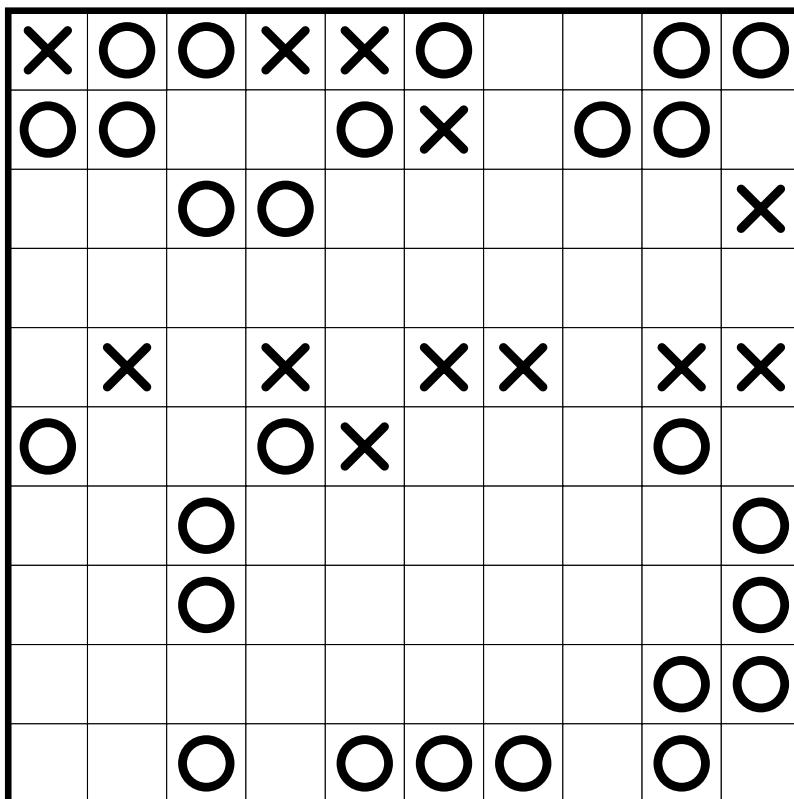
Example Answer:

XXO2X, OXOXX



5a →

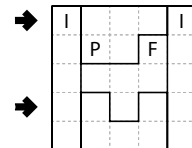
5b →





6. Pentominous [Salih Alan] (42 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.)

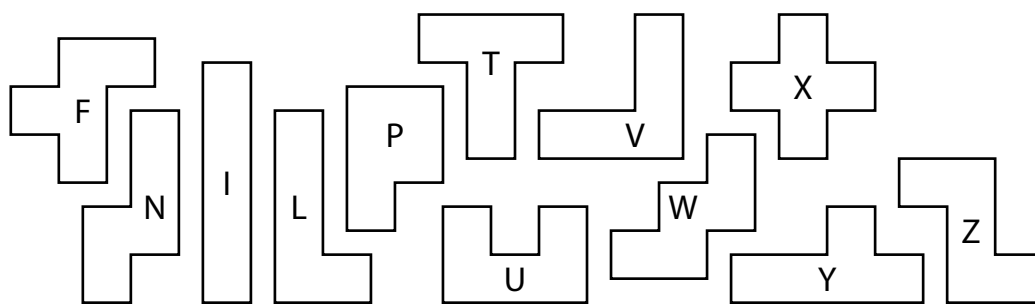


The letter-to-shape correspondence for pentominoes has been supplied for you.

In the competition puzzle, there may be black areas that are not part of the grid.

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

Example Answer: IPPPI, IUFUI



6a →

				T	
	P				
					Y
		L			
	F				I
L					L
		F			
	N			V	U
			I		

6b →

7. Kakuro (Kropki) [Ferhat Çalapkulu] (60 points)

Place a digit from 1 to 9 into each white cell. The numbers in grey cells indicate the sum of digits in the adjacent "word" across or down. (Across "words" are to the right of their sums, Down "words" are below their sums.) Digits may not repeat within a "word."

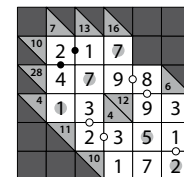
Not all "words" will have a provided sum.

A white dot on the edge of two cells indicates that those two cells must contain consecutive numbers; a black dot on the edge of two cells indicates that a number in one of those cells is double the value of the number in the other cell. If 1 and 2 are in adjacent cells, then the dot between them could be either color. If there is no dot on the edge of two cells, it means neither a black nor a white dot could go there.

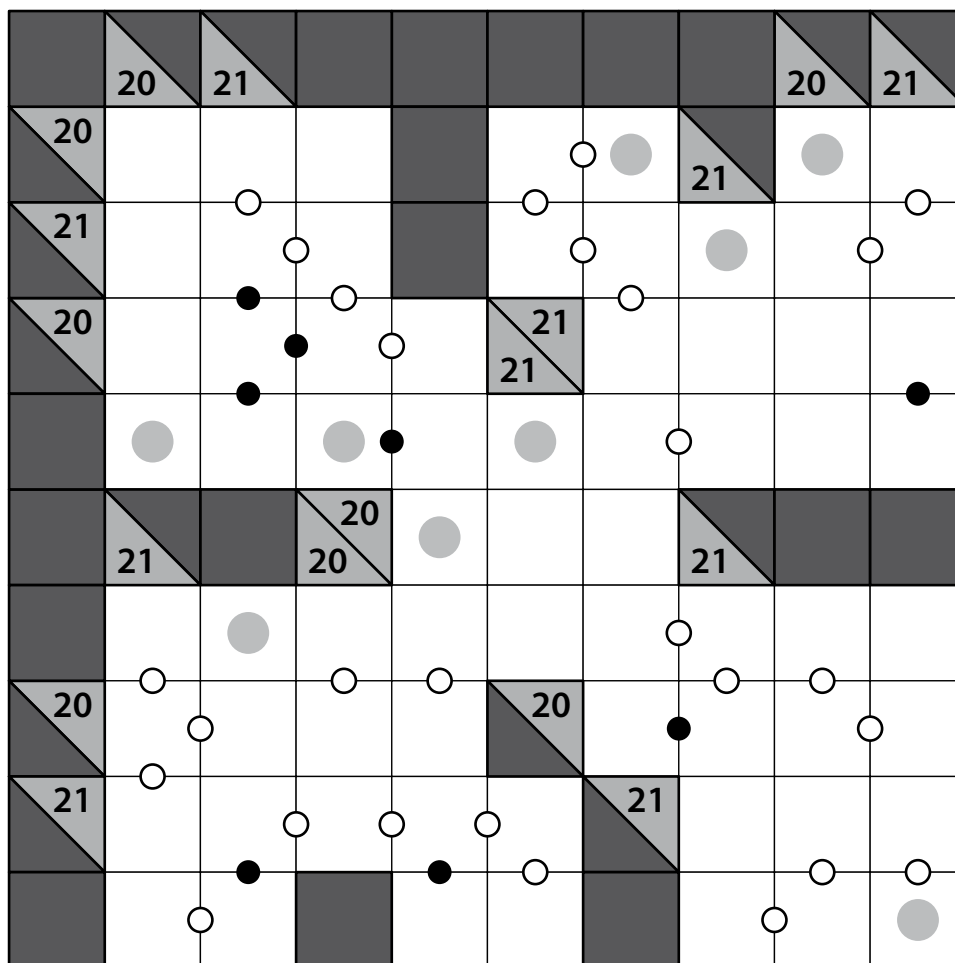
The dots in cells are only used for entering your answers.

Answer: Enter the number in the cells that each dot is in, reading the dots from left to right. (Ignore which row the dots are in.)

Example Answer: 17752



→ 1 7 7 5 2



7 → ○ ○ ○ ○ ○ ○ ○ ○ ○ ○



8. Scrabble (Endpoints) [Ferhat Çalapkulu] (86 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 orthogonally, 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.

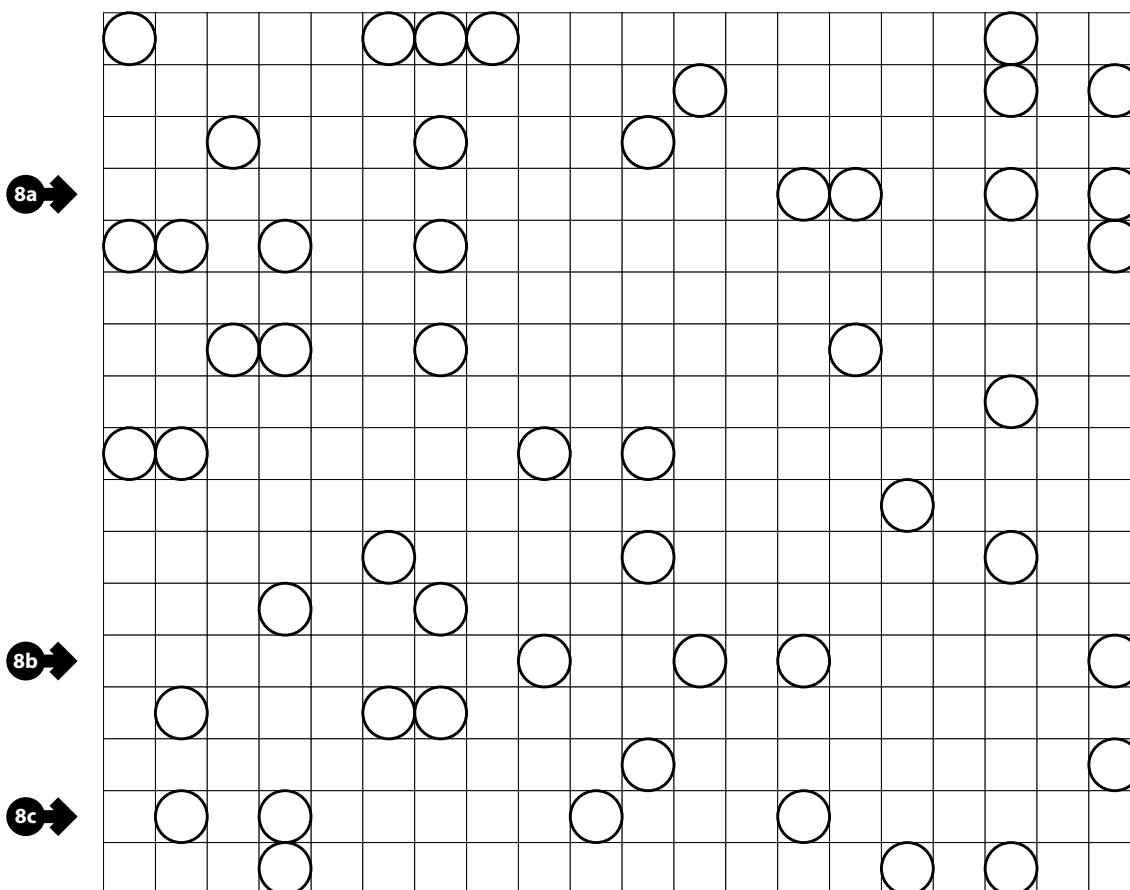


Circled cells indicate the start of a word, the end of a word, or the letter O. All possible circled cells are given.

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

- | | | |
|-----------|------------|--------------|
| ANTALYA | EGER | OULU |
| ARNHEM | ISTANBUL | PAPROTNIA |
| BANGALORE | KIRCHHEIM | PRAGUE |
| BEIJING | KOPRIVNICA | RIODEJANEIRO |
| BOROVETS | KRALJEVICA | SENEC |
| BRASOV | MINSK | SOFIA |
| BRNO | NEWYORK | STAMFORD |
| BUDAPEST | OPATIJA | UTRECHT |
| COLOGNE | | |



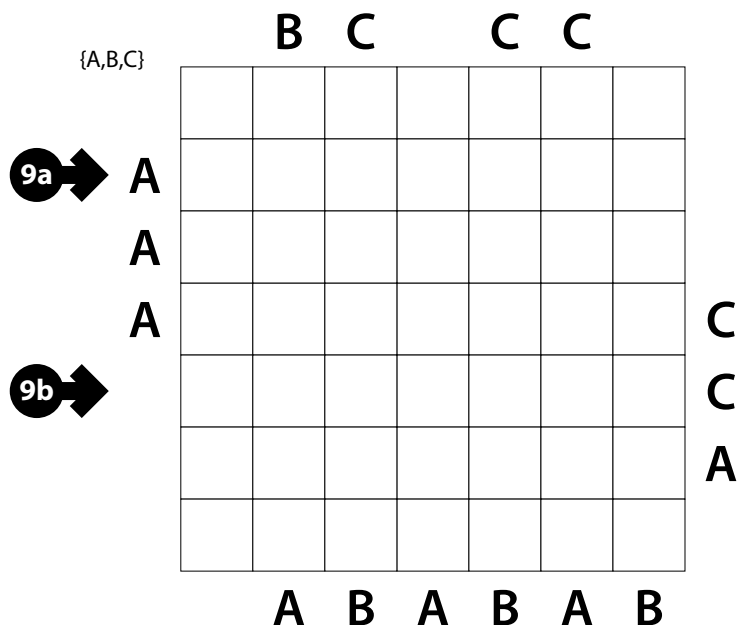
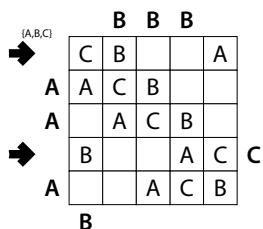


9. Easy As [Salih Alan] (72 points)

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. Some letters may already be filled in for you. Some cells might be marked with a cross; do not put any letters into those cells.

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



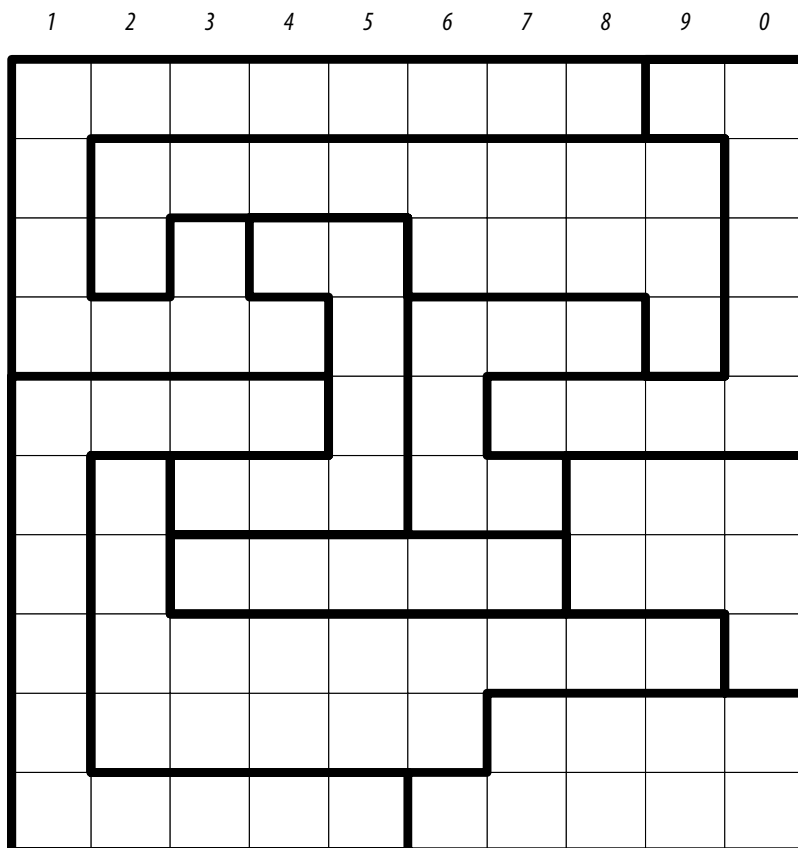
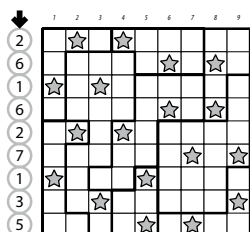
10. Star Battle [Salih Alan] (50 points)

Place stars into some cells in the grid, no more than one star per cell. Each row, each column, and each outlined region must contain exactly two stars. Cells with stars may not touch each other along an edge or a corner.

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 star appears (the number on top of that column). Use only the last digit for two-digit numbers; e.g., use '0' if the first star appears in column 10.

Example Answer: 261627135





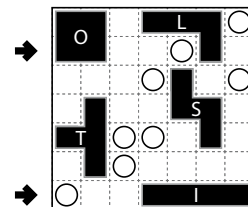
11. Statue Park [Salih Alan] (75 points)

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.

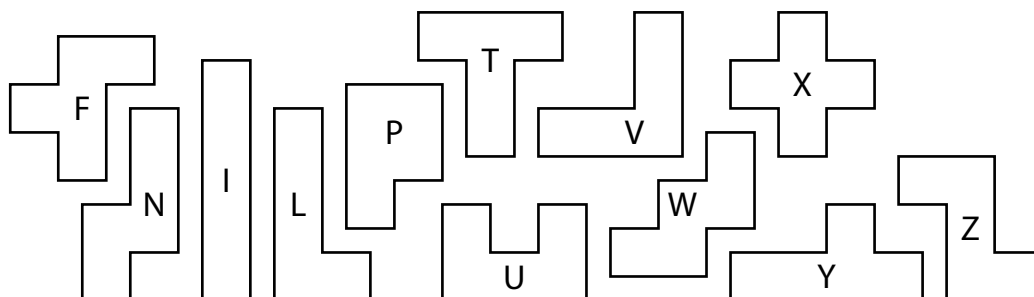
A cell with a black square must be shaded and a cell with a white circle must not be shaded.

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, AAII III



11a →

11b →

