WPF PUZZLE GP 2023 INSTRUCTION BOOKLET

Host Country: Türkiye

Salih Alan, Murat Can Tonta, Hatice Esra Aydemir

Special Notes: None.

Points:

|		
1.	Password Path	26
2.	Letter Weights	64
3.	Star Battle	17
4.	LITS	22
5.	Tapa	34
6.	Masyu	36
7.	Pentominous	46
8.	Ripple Effect	50
9.	Skyscrapers	40
10.	Square Jam	22
11.	Heteromino	15
12.	Maxi Loop	24
13.	Easy as Japanese Sums	46
14.	Kuromasu	40
15.	Range	40
16.	Chocolate Banana	51
17.	Pentomino (Blokus)	57
	TOTAL:	630

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1. Password Path [Salih Alan] (26 points)

Find a path that starts at the upper-left letter, ends at the lower-right letter, 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.
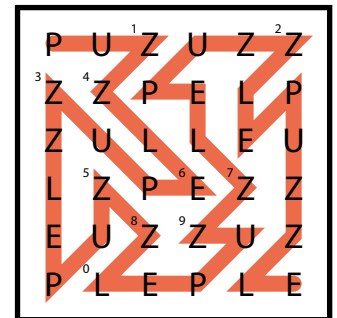
The small digits are only used for entering your answer.

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

Example Answer: 1463580972

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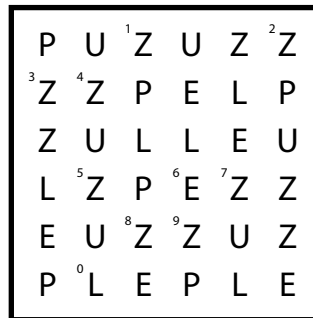
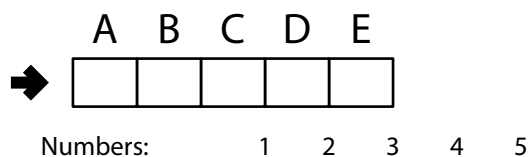## 2. Letter Weights [Murat Can Tonta] (64 points)

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`

A	B	C	D	E

Numbers: 1 2 3 4 5

CAB = 11
BEE = 7
ABE = 8

| A	B	C	D	E
2	5	4	3	1

Numbers: 1 2 3 4 5
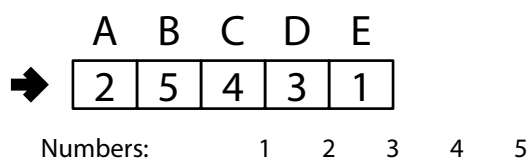
3. Star Battle [Hatice Esra Aydemir] (17 points)

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.
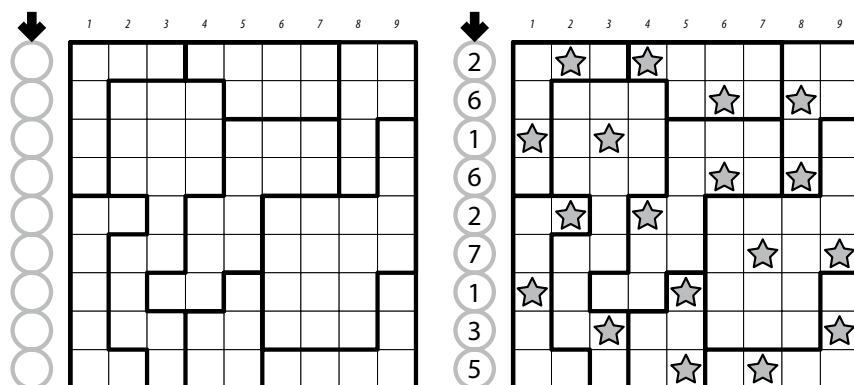
Example Answer: `261627135`

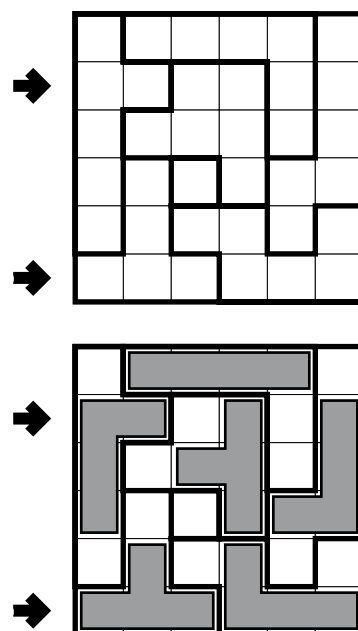## 4. LITS [Hatice Esra Aydemir] (22 points)

Shade exactly four connected cells in each outlined region (with at least four cells) to form a tetromino, so that the following conditions are true: (1) All tetrominoes are connected into one large shape along their edges; (2) No 2×2 group of cells can be entirely shaded; (3) When two tetrominoes share an edge, they must not be of the same shape, regardless of rotations or reflections. (Not all four possible shapes have to be present in the grid; for example, it is possible for your solution to not have any "I" shapes.)

Regions with fewer than four cells will not have any shaded cells.

A list of shapes to the letters "LITS" is provided. This is only needed 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 tetromino occupying that cell, or the letter '`X`' if the cell is not shaded.

Example Answer: `LLXTXL, TTTLLL`

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5. Tapa [Hatice Esra Aydemir] (34 points)

Shade some empty cells; cells with numbers cannot be shaded. All shaded 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.

Tapa Clue Examples
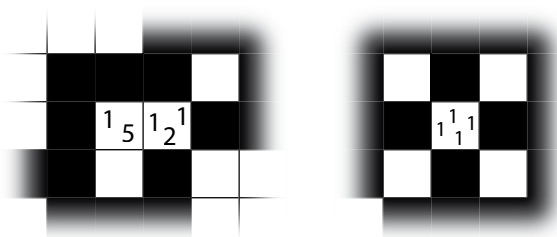
Numbers in a cell indicate the lengths of contiguous shaded cell groups along the "ring" of 8 cells touching that cell (fewer for cells along the outside edge). If there is more than one number in a cell, then there must be at least one white (unshaded) cell between the shaded cell groups. The numbers 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 can be shaded.

Answer: For each designated row, enter its contents from left to right. Use 'x' for an unshaded cell and 'o' for a shaded cell. You may use two other letters or numbers, as long as they are distinct.

Example Answer: XOOXOXOO, OOXOOOXO
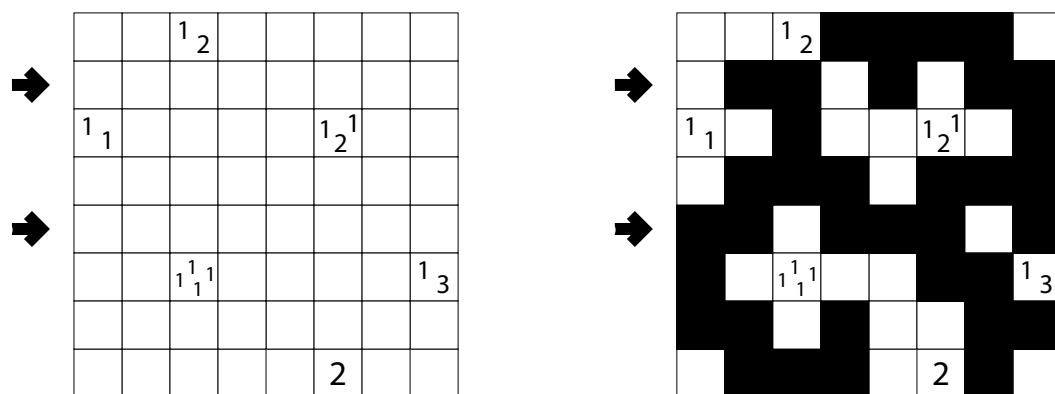
6. Masyu [Salih Alan] (36 points)

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 characters, as long as they are distinct.

Example Answer: LLXXX, LIILX

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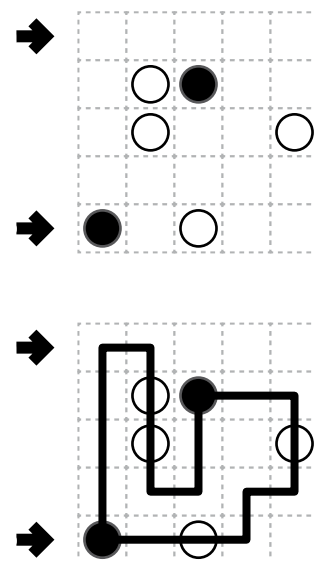
7. Pentominous [Salih Alan] (46 points)

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
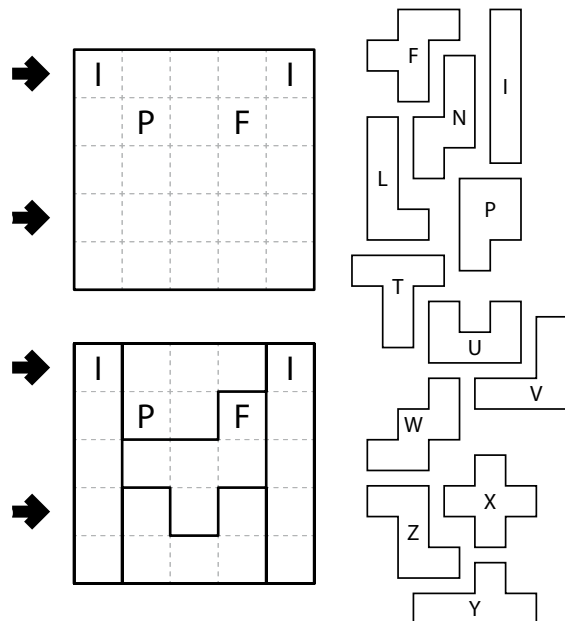
8. Ripple Effect [Hatice Esra Aydemir] (50 points)

Place a number into each cell so that each outlined region contains the numbers from 1 to X, where X is the number of cells in the region. Cells containing the same number N within the same row (or column) must have at least N cells between them in that row (or column). (For example, cells containing "1" cannot touch along an edge, cells containing "2" cannot touch or have exactly one cell between them in the same row or column, and so on.) Some numbers may be already filled in the grid.

Answer: For each designated row, enter its contents (including any given numbers).
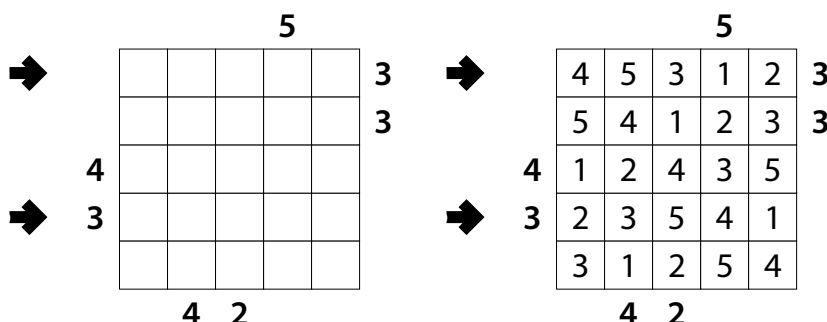
Example Answer: 121314,213241
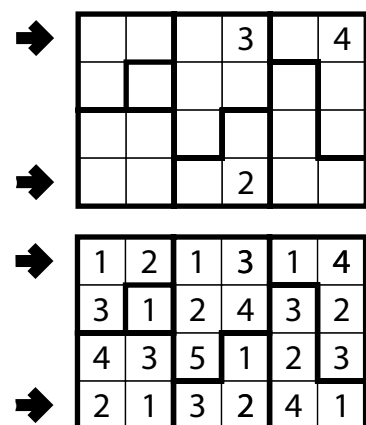
9. Skyscrapers [Murat Can Tonta] (40 points)

Place a number from 1 to X 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 how many skyscrapers can be seen in the respective row or column from the respective direction; shorter skyscrapers are hidden behind taller ones. Some numbers may already be filled in for you.

Answer: For each designated row, enter its contents from left to right. Do *not* include any numbers outside the grid.

Example Answer: 45312,23541

Skyscraper Clue Examples

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10. Square Jam [Murat Can Tonta] (22 points)

Divide the grid into squares along the dotted grid lines such that each cell is in exactly one square. There must not be any locations in the grid where four squares touch. Each given number in the grid must be inside a square with a side length equal to that number. (It is possible for a square to not contain any given numbers, or a square to contain multiple numbers.)

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

Answer: Enter the side length of the square each dot is in, reading the dots from left to right. (Ignore which row the dots are in.) Use only the last digit for two-digit numbers; e.g., use '0' for a square of side length 10.

Example Answer: 22321
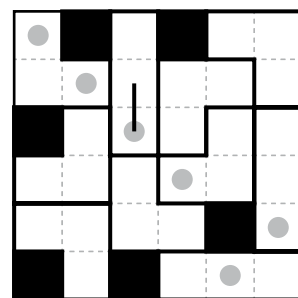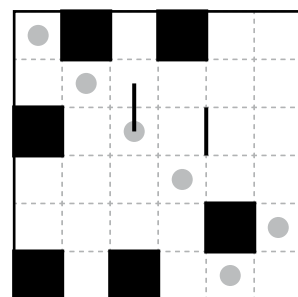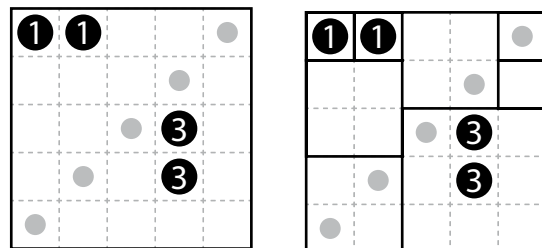
11. Heteromino [Murat Can Tonta] (15 points)

Divide the grid into triominoes along the dotted grid lines such that triominoes of the same shape never touch along an edge. Rotations and reflections of a triomino do *not* count as the same shape. Some cells may be connected with a line; those must be part of the same triomino. Some cells may be separated by a thick border; those must not be part of the same triomino.

The dots in cells are only used for entering your answers. Black areas (if given) are not part of the grid and cannot be part of a triomino.

Answer: Enter the letter for the cell each dot is in, reading the dots from left to right. (Ignore which row the dots are in.) The letter for a cell is 'I' if the cell is in a rectangular triomino, and 'L' if the cell is not in a rectangular triomino. You may use other characters, as long as they are distinct.
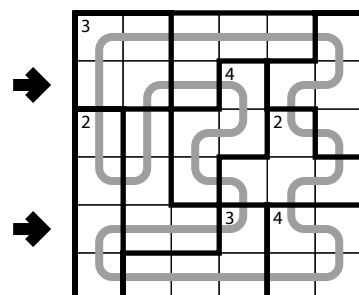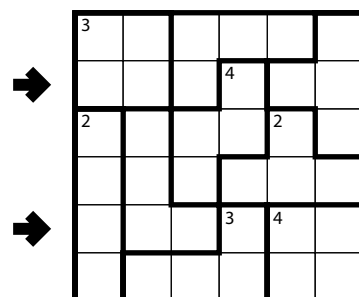
Example Answer: LLILII

12. Maxi Loop [Hatice Esra Aydemir] (24 points)

Draw a single closed loop that only travels orthogonally and goes through every cell exactly once. A number given in an outlined region indicates the longest (uninterrupted) length of the loop in that region (counted by number of cells).

Answer: For each designated row, enter its contents from left to right. Use 'I' for a cell in which the loop goes straight, and 'L' for a cell in which the loop turns. You may use two other characters, as long as they are distinct.

Example Answer: ILILLL, LIILLL

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13. Easy as Japanese Sums [Salih Alan] (46 points)

Place a number from the specified list into some cells so that every number appears exactly once in each row or column. Cells may remain empty. Each number outside the grid indicates the sum of the first continuous group of at least one number (including "sums" of a single number) that is encountered in the respective row or column from the respective direction. The group ends at the edge of the grid or a cell without a number. Some cells might be marked with a cross; do not put any numbers into those cells.

Unlike a standard "Japanese Sums" puzzle, it is not possible for numbers in the list to be missing from any rows or columns.

Answer: For each designated row, enter its contents, using 'X' for an empty cell. Do not include any numbers outside the grid.

Example Answer: 213XX,X3X12
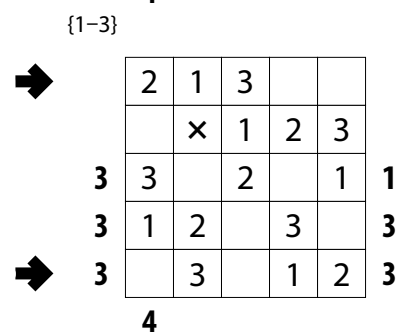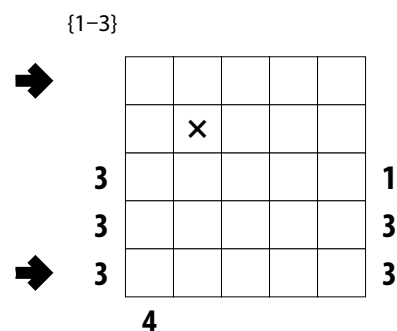
14. Kuromasu [Hatice Esra Aydemir] (40 points)

Shade some cells so that all remaining cells are connected orthogonally and no two shaded cells share an edge. Each numbered cell indicates the total count of unshaded cells connected in line vertically and horizontally to the numbered cell *including the cell itself*.

Cells with circles must not be shaded.

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 shaded square appears. Use only the last digit for two-digit numbers; e.g., use '0' if the first shaded square appears in column 10. If the row is empty, enter '0'.

Example Answer: 31250
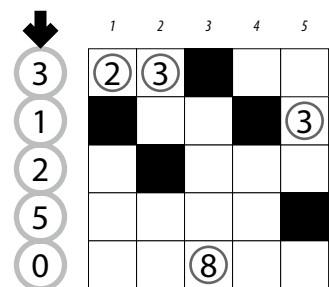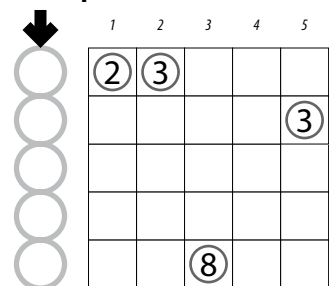
15. Range [Salih Alan] (40 points)

Some cells in the grid are marked with a cross; let X be the number of uncrossed cells in each row or column. Place a number into each empty cell so that in each row and column, each number from 1 to X appears exactly once in an uncrossed cell.

Some clues are given in the crossed cells; each clue is about the numbers that can be seen in that direction from the crossed cells before encountering another crossed cell or the edge of the grid. If there is only one number, then the clue is equal to that number; otherwise, the clue is the difference of the largest seen number and the smallest seen number.

Answer: For each designated row, enter the contents of the uncrossed cells, from left to right.

Example Answer: 231,231

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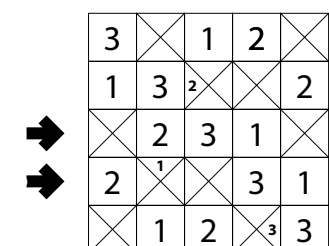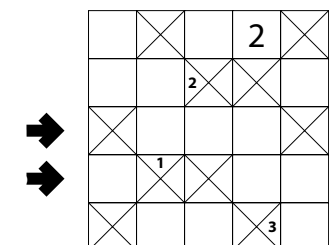
16. Chocolate Banana [Murat Can Tonta] (51 points)

Divide the grid along the dotted grid lines into regions. Each region must either be "chocolate" (in the shape of a rectangle or square), or "banana" (not in the shape of a rectangle nor square). No two "chocolate" regions may share an edge, and no two "banana" regions may share an edge. Each given number indicates the area of the region that number is in. (It is possible for a regions to contain no numbers, or to contain multiple numbers.)

The shading of "chocolate" in the solution is only to make the solution easier to see. The dots in cells are only used for entering your answers.

Answer: Enter the area of the region each dot is in, reading the dots from left to right. (Ignore which row the dots are in.) Use only the last digit for two-digit numbers; e.g., use '0' for a region of area 10.

Example Answer: 62445
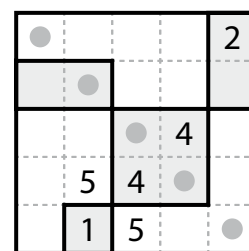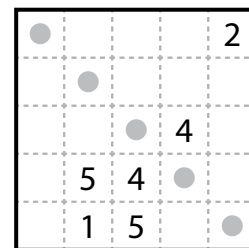
17. Pentomino (Blokus) [Murat Can Tonta] (57 points)

Shade some cells so that the shaded cells form the shapes of twelve different pentominoes. Each pentomino shape is used exactly once, but can be rotated or reflected. Pentominoes cannot touch along edges, but can touch at corners. If a corner is marked with a dot, then two pentominoes touch at that corner. If a corner is not marked with a dot, then two pentominoes do not touch at that corner.
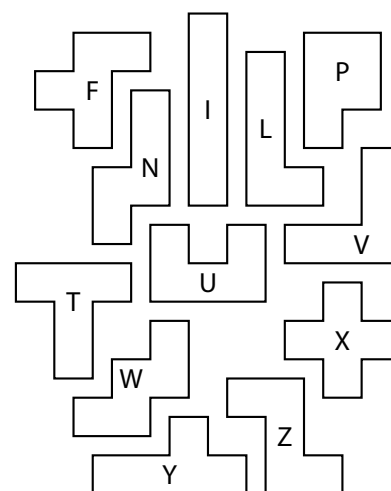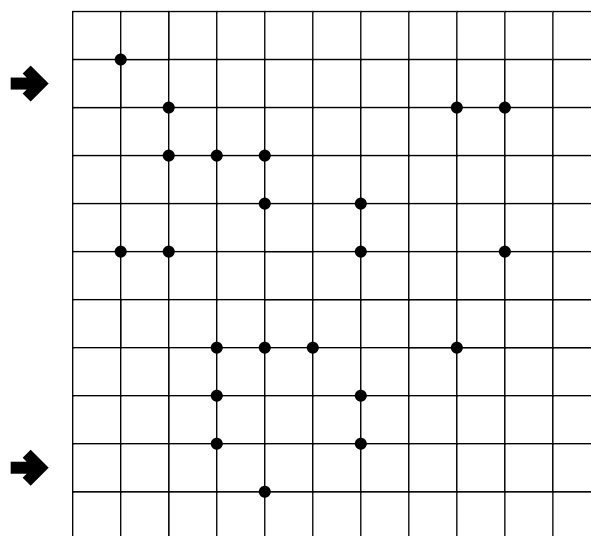
Answer: For each designated row, enter the letter for each pentomino that appears in that row, from left to right. Within a row, if a pentomino occupies more than one cell, only enter that pentomino's letter once. If there are no pentominoes in that row, enter a single letter 'A'.

Example Answer: YWLU,PXI