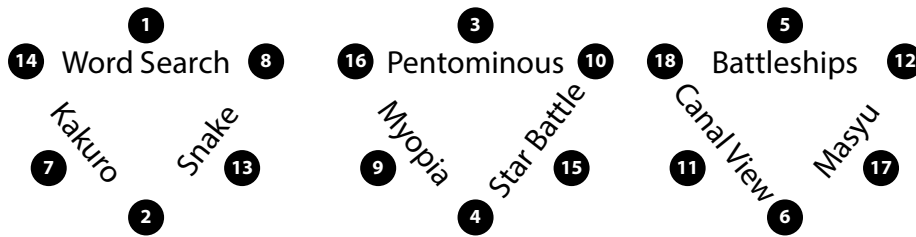# WPF PUZZLE GP 2023 INSTRUCTION BOOKLET

Host Country: India

Chandrachud Nanduri, Rajesh Kumar, Madhav Sankaranarayanan, Anubhav Balodhi, Prasanna Seshadri

Special Notes: Odd-numbered puzzles are "evergreen" puzzles; even-numbered puzzles are hybrids of odd-numbered puzzles, as per the chart below.

Points:

1.	Word Search	34		10.	Pentominous (Star Battle)	35
2.	Kakuro (Small Snake)	57		11.	Canal View	26
3.	Pentominous	46		12.	Masyu (Battleships)	58
4.	Star Battle (Myopia)	15		13.	Snake	84
5.	Battleships	29		14.	Kakuro (Number Search)	52
6.	Masyu (Canal View)	19		15.	Star Battle	52
7.	Kakuro	65		16.	Pentominous (Myopia)	66
8.	Snaky Word Search	24		17.	Masyu	28
9.	Myopia	44		18.	Battleships (Canal View)	69
					TOTAL:	803

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1. Word Search [Anubhav Balodhi] (34 points)

Locate some words from the list of words in the grid. Words always appear along a straight line in one of the standard directions.

Three words will not be found in the grid.

Answer: Enter the missing words, in alphabetical order, one word per answer space.

Example Answer: GRAB, LAG, SLAB

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2. Kakuro (Small Snake) [Prasanna Seshadri] (57 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."

It is possible for some "words" to not have a provided sum.

All white cells that you put the digits 1, 2, 3, or 4 in must form the shape of a "snake" in the grid. The snake is a path that starts in a cell, goes through some number of cells orthogonally, and ends in a cell. Each cell is used at most once by the snake. The snake may not loop around to touch itself, not even diagonally. (In other words, if two cells in the snake touch orthogonally, then they must be exactly one cell apart along the path of the snake, and if two cells in the snake touch diagonally, then they must be exactly two cells apart along the path of the snake.)

A rounded square in a cell (when provided) indicates an end of the snake.

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

Answer: Enter the contents of each circled cell, reading the cells from left to right. (Ignore which row the circles are in.)

Example Answer: 68317
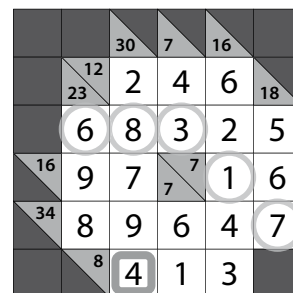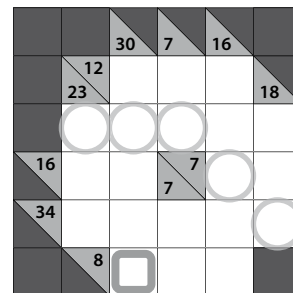


3. Pentominous [Chandrachud Nanduri] (46 points)

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

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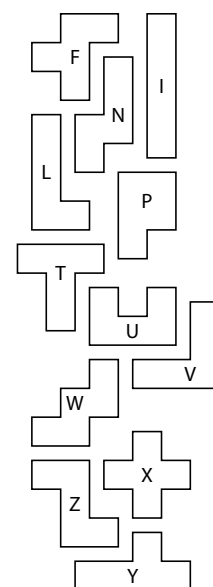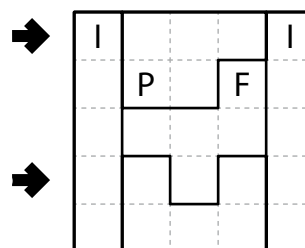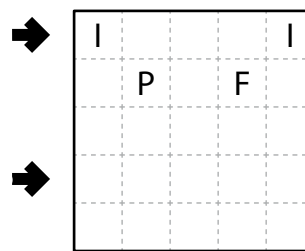
## 4. Star Battle (Myopia) [Chandrachud Nanduri] (15 points)

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

Arrows in a cell indicate *all* closest stars to that cell along the four orthogonal directions (if there are multiple stars of the same closest distance to the cell, there will be multiple arrows). If there is a single star in the same cell as a cell with arrows, then all four arrows must be present (as the distance is 0 in all directions).

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: 461352
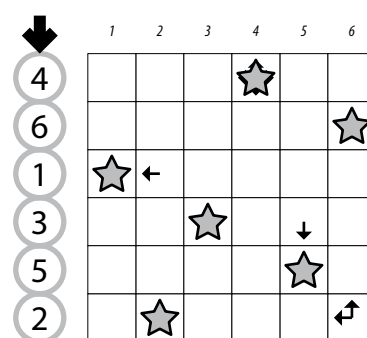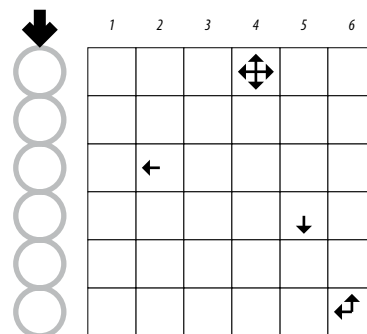
## 5. Battleships [Chandrachud Nanduri] (29 points)

Locate the indicated fleet of ships in the grid. Ships may be rotated before being placed in the grid. Each piece of a ship occupies a single cell. A cell that does not contain a ship piece is considered "sea". Ships do not touch each other, not even diagonally (that is, if two ship pieces are in cells that share an edge or a corner, they must be part of the same ship). The contents of some cells are given for you (wavy lines indicate "sea").

Each number to the top or left of the grid reveals the number of ship pieces that must be located in that row or column (including any that might be given for you).

The numbers on the far 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 ship piece appears (the number on the far top of that column). Use only the last digit for two-digit numbers; e.g., use '0' if the first ship piece appears in column 10. If the row has no ship pieces, enter '0'.

Example Answer: 1317171

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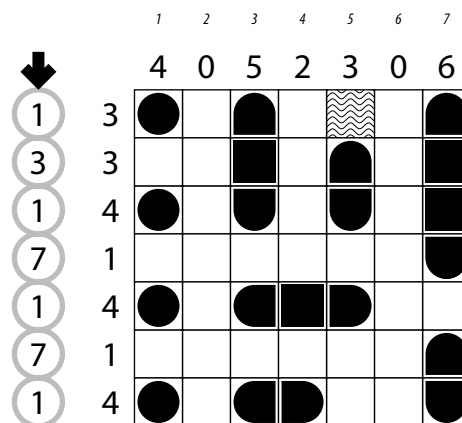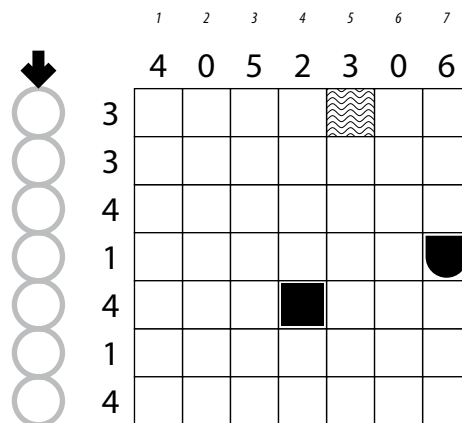
## 6. Masyu (Canal View) [Prasanna Seshadri] (19 points)

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

Cells without diamonds that the loop goes through are considered "canal" cells. Each number indicates the total count of canal cells connected in line vertically and horizontally to the numbered cell. (Note that the meaning of "connected in line" here ignores the actual path of the loop.) Unlike in a standard Canal View puzzle, it is permissible to have a 2×2 group of canal cells, and the canal cells do not need to all be connected.

The connected "canal" cells in the example solution are only shaded for illustrative purposes, and are not part of the puzzle solution.

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: `IILLIX,XXXLIL`
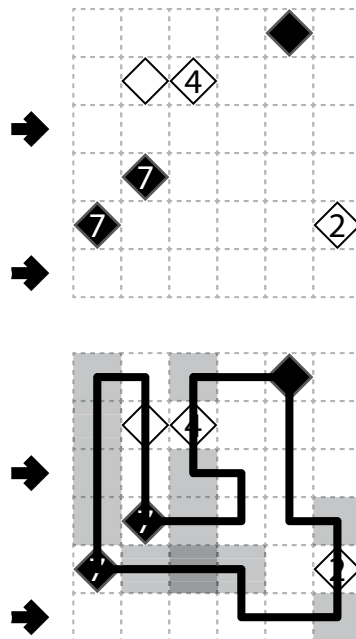
## 7. Kakuro [Prasanna Seshadri] (65 points)

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."

It is possible for some "words" to not have a provided sum.

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

Answer: Enter the contents of each circled cell, reading the cells from left to right. (Ignore which row the circles are in.)

Example Answer: `17752`
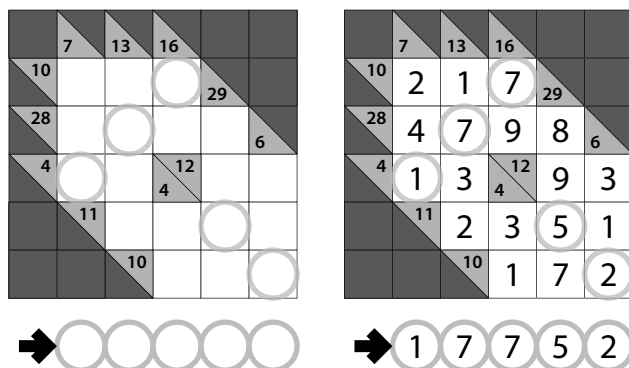
8. Snaky Word Search [Anubhav Balodhi] (24 points)

Locate the list of words in the grid. Each word is in the shape of a "snake" (with diagonals) in the grid. A snake is a path that starts at a letter, goes through some number of letters in any of the standard eight directions, and ends at a letter. Each letter is used at most once by a snake. A snake may not make turns sharper than 90 degrees and may not loop around to touch itself, not even diagonally. (In other words, if two letters in a snake are adjacent orthogonally, then they must be exactly one apart along the path of that snake, and if two letters in a snake are adjacent diagonally, then they must be exactly one or two letters apart along the path of that snake).

Snakes cannot touch each other, not even diagonally.

Answer: For each designated row, enter its contents. Use 'O' for a cell occupied by a snake and 'X' for a cell not occupied by a snake. You may use other characters, as long as they are distinct.
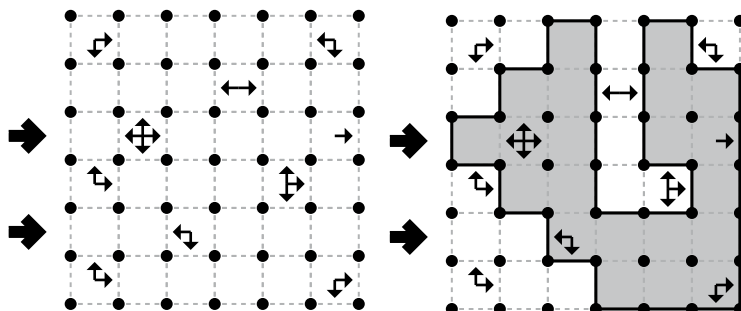
Example Answer: `OOXXO,OXXOX`
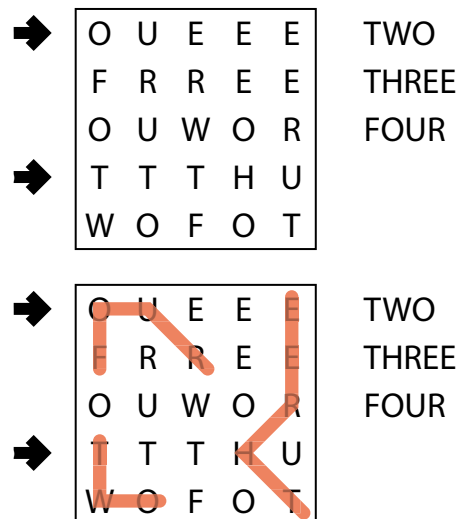
9. Myopia [Madhav Sankaranarayanan] (44 points)

Draw a single, non-intersecting loop that only consists of orthogonal line segments between the dots. Arrows in a cell indicate *all* closest loop edges to that cell along the four orthogonal directions (if there are multiple loop edges of the same closest distance to the cell, there will be multiple arrows).
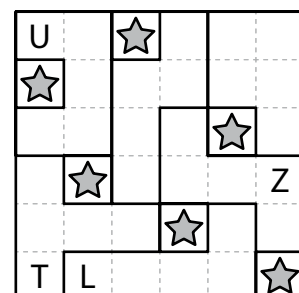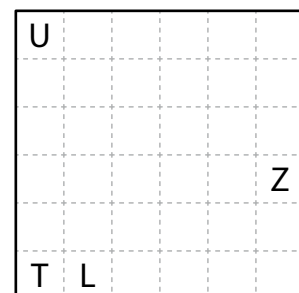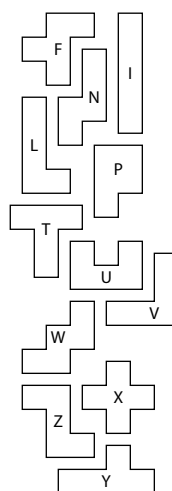
Answer: For each designated row, enter its contents from left to right. Use 'O' for a cell inside the loop and 'X' for a cell outside the loop. You may use two other characters, as long as they are distinct.

Example Answer: OOOXOO, XXOOOO

10. Pentominous (Star Battle) [Chandrachud Nanduri] (35 points)

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

Then, divide the grid into pentominoes such that every unstarred 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.

Answer: For each designated row, enter the letter for the pentomino that each cell belongs to, from left to right. If the cell contains a star, enter 'S' instead.
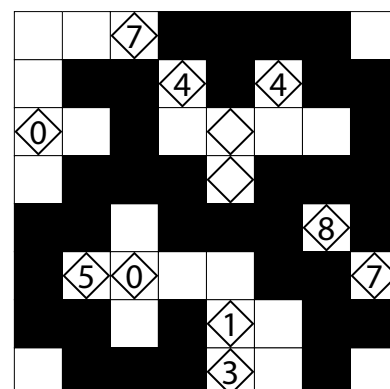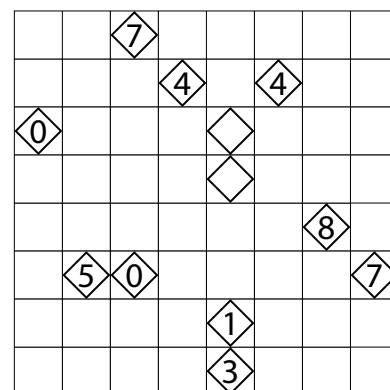
Example Answer: SUNNPP, TTTSLZ

11. Canal View [Chandrachud Nanduri] (26 points)

Shade some empty cells; cells with diamonds 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.

Each number in a diamond indicates the total count of shaded cells connected in line vertically and horizontally to the numbered cell.

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

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12. Masyu (Battleships) [Madhav Sankaranarayanan] (58 points)

Draw a single loop that passes orthogonally through centers of cells. The loop must go through all cells with a white or wavy circle. 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 wavy circles, but must go straight in both cells immediately before and after each wavy circle.

Then, the indicated fleet of ships must be placed in the grid in cells that the loop does not pass through. Ships may be rotated. Each piece of a ship occupies a single cell. Ships do not touch each other, not even diagonally (that is, if two ship pieces are in cells that share an edge or a corner, they must be part of the same ship). Some ship pieces are given for you. Cells with wavy lines cannot contain ship pieces (but may or may not contain parts of the loop).

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.

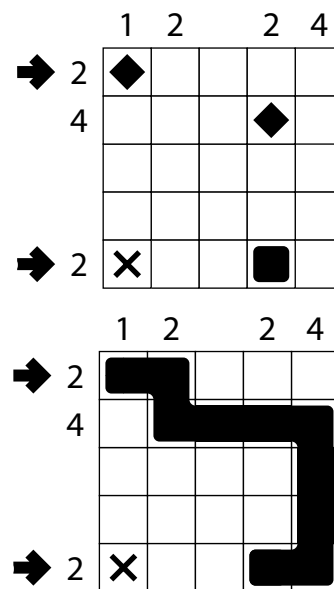**Example Answer**: IILLIX, XXXLIL
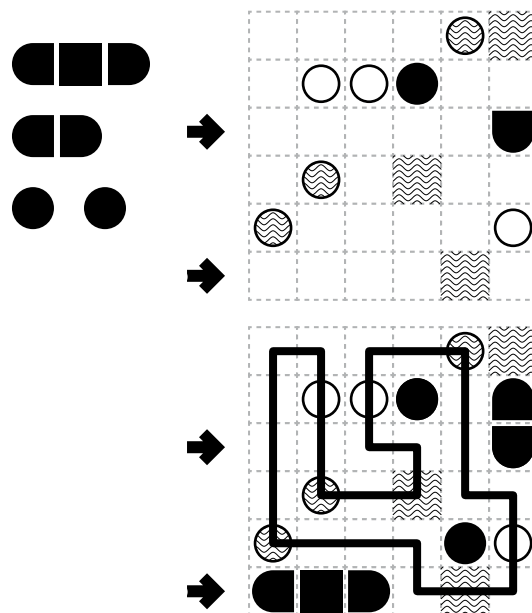
13. Snake [Chandrachud Nanduri] (84 points)

Locate a "snake" in the grid. The snake is a path that starts in a cell, goes through some number of cells orthogonally, and ends in a cell. Each cell is used at most once by the snake. The snake may not loop around to touch itself, not even diagonally. (In other words, if two cells in the snake touch orthogonally, then they must be exactly one cell apart along the path of the snake, and if two cells in the snake touch diagonally, then they must be exactly two cells apart along the path of the snake.) Numbers outside the grid, if given, indicate how many cells in that row or column are occupied by the snake.

A cross in a cell (when provided) indicates that the snake cannot go through the cell. A diamond in a cell (when provided) indicates that the snake must go through (or end in) that cell. A rounded square in a cell (when provided) indicates that that cell must be an end of a snake.

Answer: For each designated row, enter its contents. Use 'O' for a cell occupied by the snake and 'X' for a cell not occupied by the snake. You may use other characters, as long as they are distinct.

Example Answer: OOXXX, XXXOO

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14. Kakuro (Number Search) [Prasanna Seshadri] (52 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."

It is possible for some "words" to not have a provided sum.

After all the digits are placed, the list of numbers must be locatable in the white cells of the grid. Numbers always appear in a line in one of the eight standard directions. Unlike in a standard word search, the numbers *must not* intersect or overlap in any digits (but diagonal numbers may have their paths intersect at cell corners).

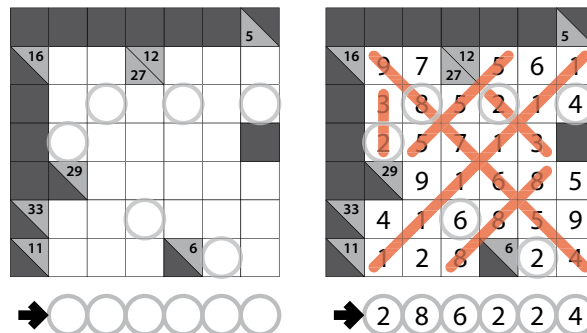*The circles in cells are only used for entering your answers.*

Answer: Enter the contents of each circled cell, reading the cells from left to right. (Ignore which row the circles are in.)

Example Answer: 286224

15. Star Battle [Rajesh Kumar] (52 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
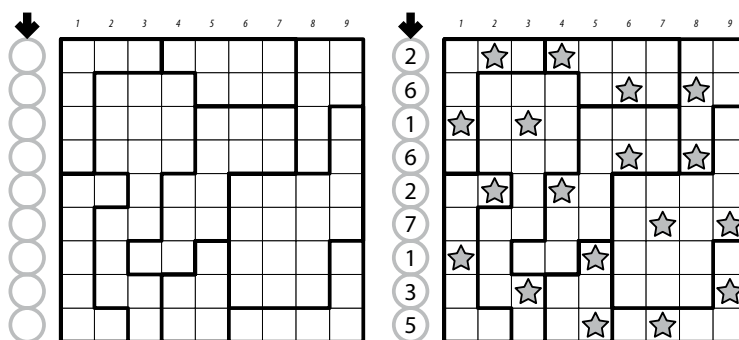
## 16. Pentominous (Myopia) [Prasanna Seshadri] (66 points)

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). (It is possible for some pentomino shapes to never appear in the grid, or more than once.)

Arrows in a cell indicate *all* closest cells that are part of a different pentomino as that cell's along the four orthogonal directions (if there are multiple other such cells of the same closest distance to the cell, there will be multiple arrows).

The letter-to-shape correspondence for pentominoes has been supplied for you, but this is only needed for submitting your answer.

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

Example Answer: LNNPP,YYYYW
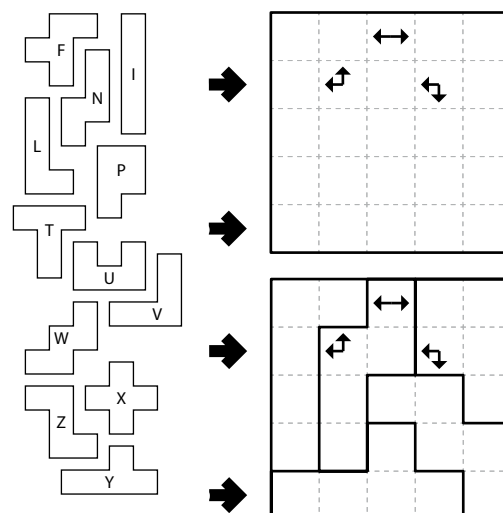
17. Masyu [Rajesh Kumar] (28 points)

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
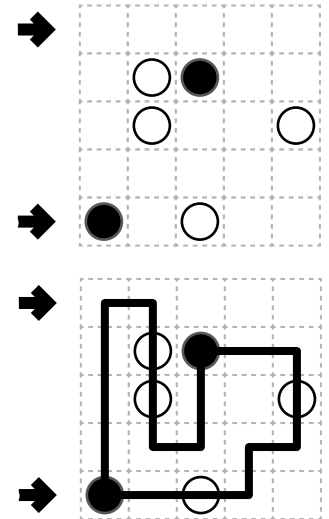
18. Battleships (Canal View) [Anubhav Balodhi] (69 points)

Locate the indicated fleet of ships in the grid. Ships may be rotated before being placed in the grid. Each piece of a ship occupies a single cell. A cell that does not contain a ship piece *and does not contain a diamond* is considered "sea". Ships do not touch each other, not even diagonally (that is, if two ship pieces are in cells that share an edge or a corner, they must be part of the same ship). The contents of some cells may be given for you.

Each number to the top or left of the grid reveals the number of ship pieces that must be located in that row or column (including any that might be given for you).

All "sea" 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.) The sea region may not contain any 2×2 group of squares.

Each number in a diamond indicates the total count of sea cells connected in line vertically and horizontally to the numbered cell.

The numbers on the far 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 ship piece appears (the number on the far top of that column). Use only the last digit for two-digit numbers; e.g., use '0' if the first ship piece appears in column 10. If the row has no ship pieces, enter '0'.

Example Answer: 615251