Puzzle: Universal Cup Final

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Little Cyan Fish is a fan of logic puzzles. He decides to introduce the puzzle track to the Universal Cup in the new season and replace the WPF Puzzle Grand Prix. Here is his first experiment.

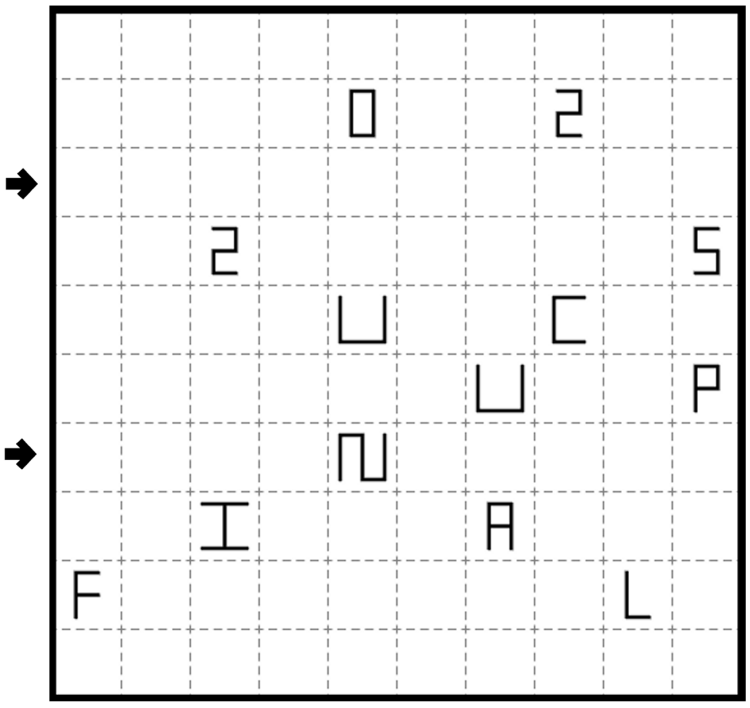
You need to solve these six puzzles to solve this problem and submit the answer key for each puzzle in order. If there are several rows in the answer key of a puzzle, separate each row by a space or a line breaker.

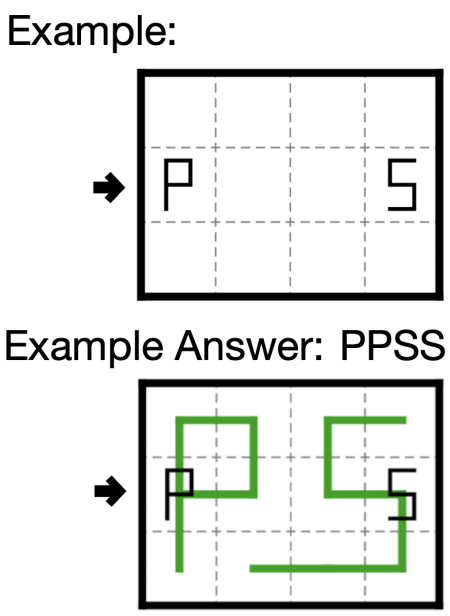
It is not recommended to solve these puzzles by solver.

1. Curve Data

Rules: Draw lines that connect cells orthogonally through their centers. Some cells have shape clues in them. For each shape clue, the shape of the lines that connect to that clue must match the shape, except that the lengths of straight lines do not have to match (but cannot be zero). Each cell without a shape clue must be connected to exactly one cell with a shape clue. Cells with shape clues cannot be connected to each other.

Answer Key: The 3rd row and the 7th row. For each designated row, enter the upper case letter or the number for the shape that each cell belongs to, from left to right. The letters for each clue are `0225UCUPNIAFL` in the reading order.

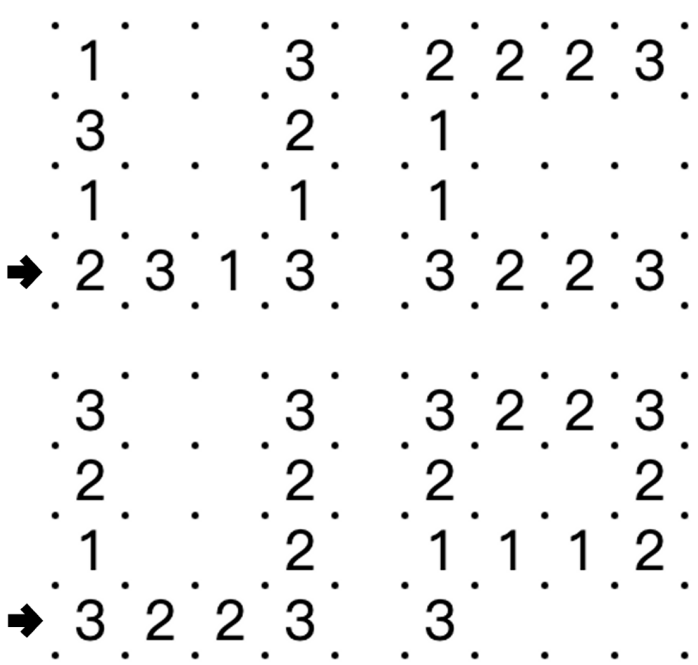




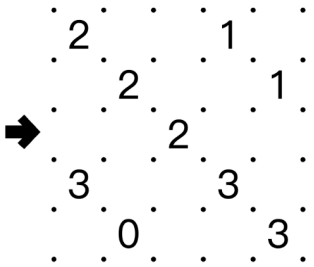
2. Slitherlink

Rules: 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.

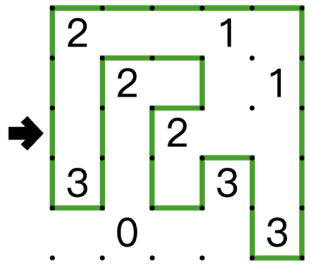
Answer Key: The 4th row and the 9th row. For each designated row, enter its contents from left to right. Use `O` for a cell inside the loop and `X` for a cell outside the loop.



Example:



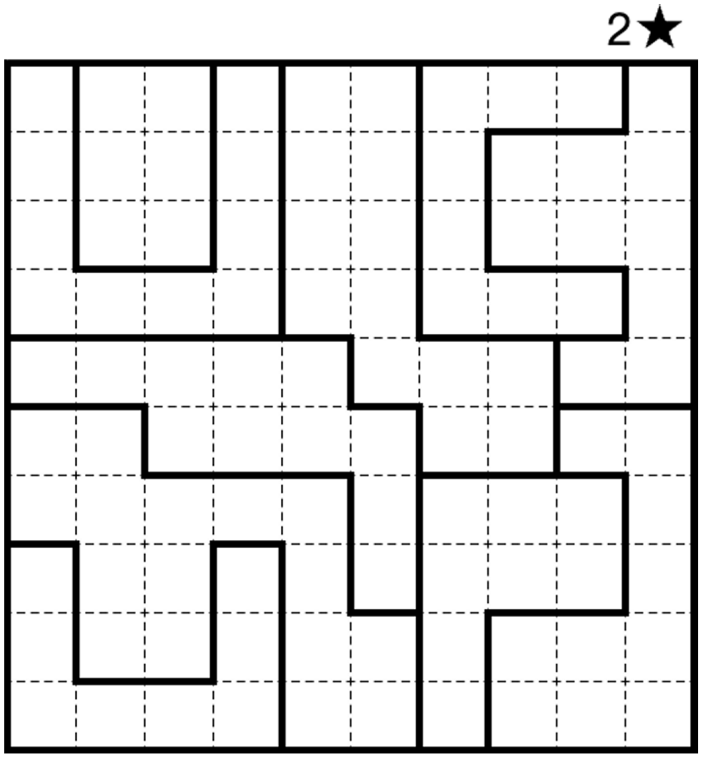
Example Answer: OXOOO



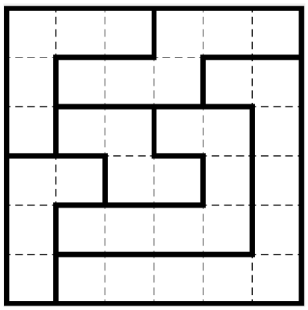
3. Star Battle

Rules: 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 (one star in the example). Cells with stars may not touch each other along an edge or a corner.

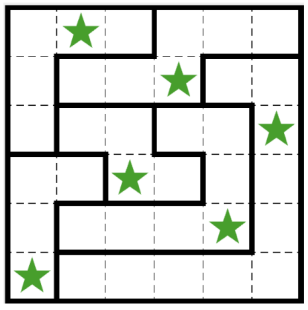
Answer Key: For each row from top to bottom, enter the number of the first column from the left where a star appears.



Example (One star):



Example Answer: 246351

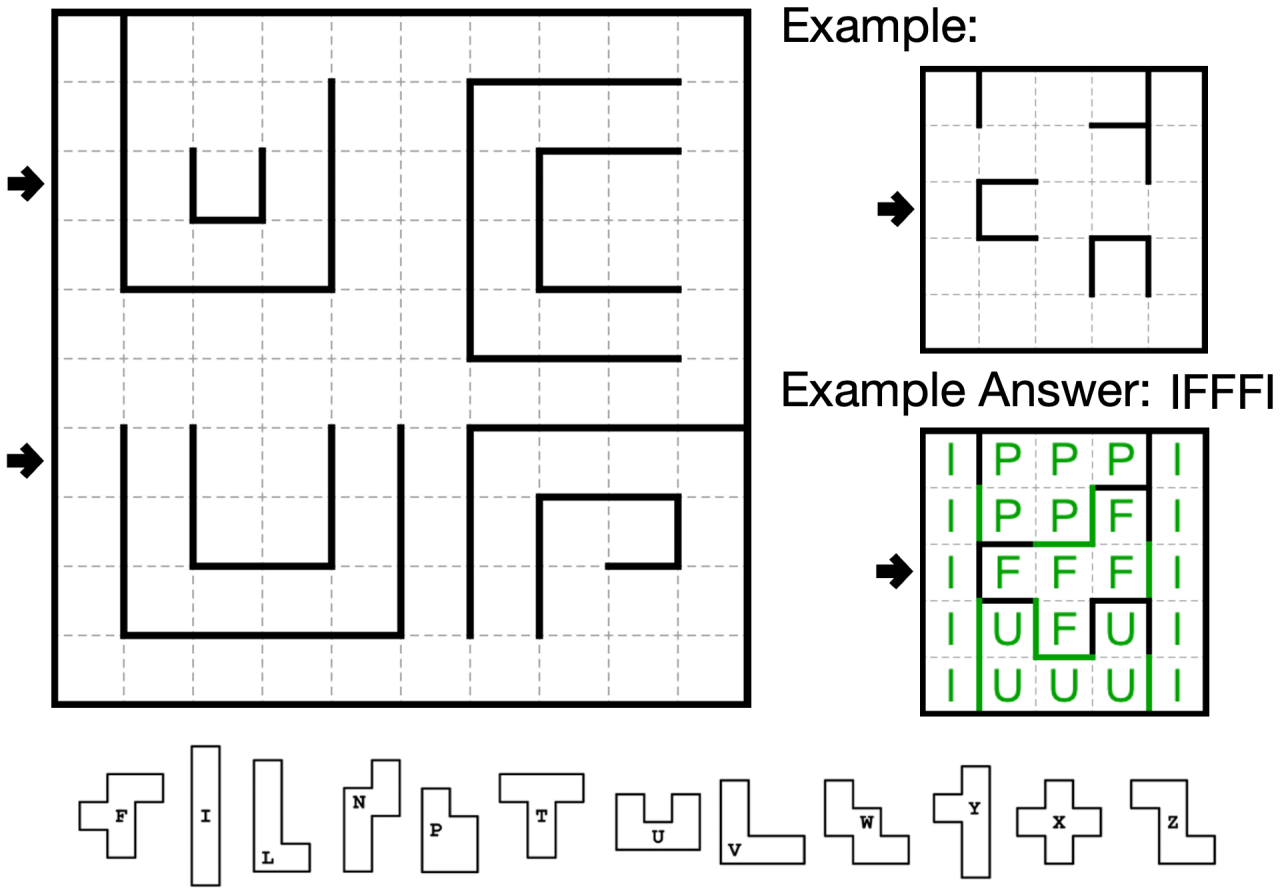


4. Pentominous(Borders)

Rules: 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 borders are given in the grid. Each border must separate two pentominoes. (It is possible for some pentomino shapes to never appear in the grid, or more than once.)

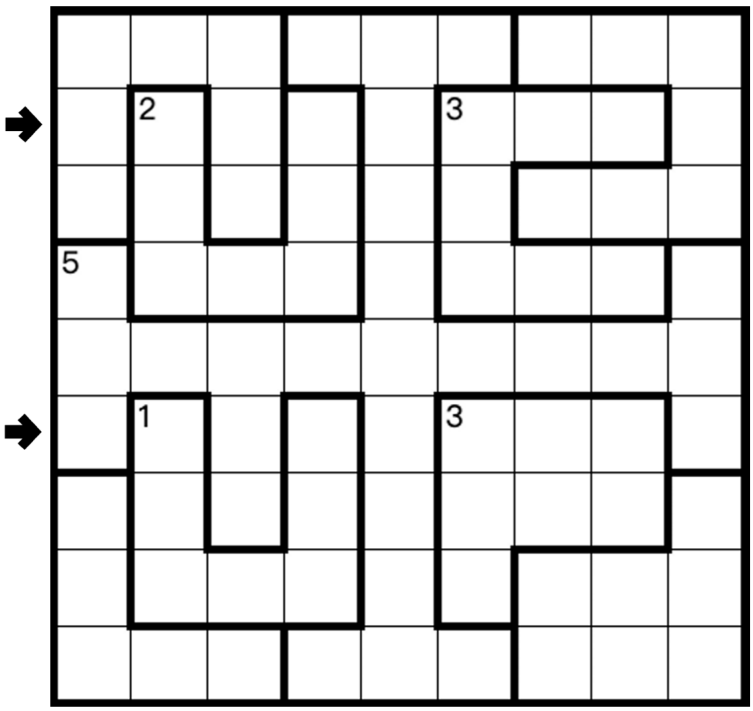
Answer Key: The 3rd row and the 7th row. For each designated row, enter the letter for the pentomino that each cell belongs to, from left to right.



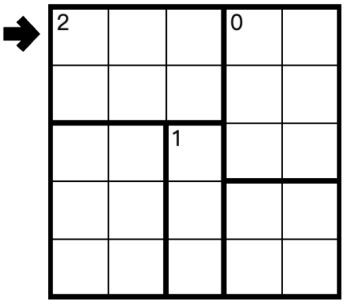
5. Yajilin(Regions)

Rules: Blacken some cells so that you can draw a single closed loop (without intersections or crossings) through all remaining white cells. Loop paths must be orthogonal. Blackened cells cannot share an edge with each other. The grid is divided into regions by thick borders; a number in a region indicates exactly how many cells in that region must be blackened. Numbered cells may be blackened and does not affect its value as a clue. The number of blackened cells for a region without a number is for you to determine.

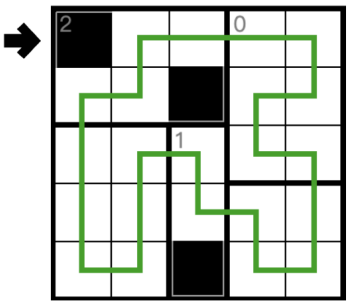
Answer Key: The 2nd row and the 6th row. For each designated row, enter the letter for each cell, from left to right. The letter for a cell is `I` if the loop goes straight through the cell, `L` if the loop turns in the cell, and `X` if the cell is black.



Example:



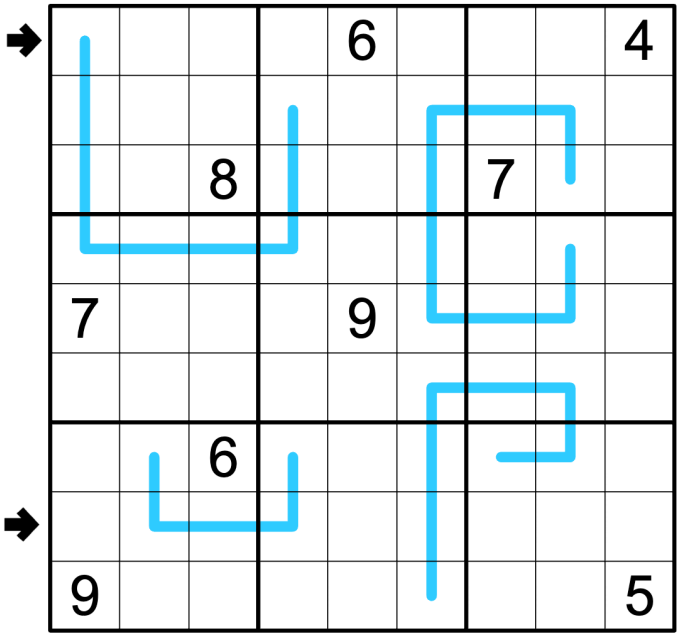
Example Answer: XLIIL



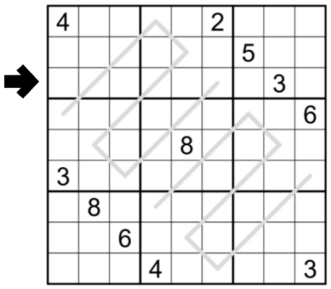
6. Region Sum Lines Sudoku

Rules: Place a digit from 1-9 in each empty cell in the grid such that each row, column and marked 3×3 box contains each digit exactly once. For each line, digits on the line have an equal sum N within each box it passes through. If a line passes through the same box more than once, each individual segment of such a line within that box sums to N separately.

Answer Key: The 1st row and the 8th row. For each designated row, enter the number for each cell, from left to right.



Example:



Example Answer: 257198634

4	6	8	3	5	2	9	1	7
9	1	3	6	4	7	5	2	8
2	5	7	1	9	8	6	3	4
8	4	5	2	1	9	3	7	6
6	2	9	7	8	3	1	4	5
3	7	1	5	6	4	2	8	9
1	8	4	9	3	6	7	5	2
7	3	6	8	2	5	4	9	1
5	9	2	4	7	1	8	6	3