

Round 13 Team: Loopfinder

75 minutes – 3000 points

Loopfinder 3000 points
 (partial solution: 40 points per correctly assigned rule)
 (partial solution: 90 points per solved grid)

This round consists of eight separate puzzle grids that are part of one large puzzle. Each grid has different rules. The task is to determine which rules belong to which grid, and solve the resulting puzzles.

The following general rules are valid for all eight puzzle grids:

Draw a closed loop into the grid that runs horizontally and vertically. The loop must pass through all cells with circles and numbers. The loop may cross itself (unless this is prohibited by a special rule for an individual grid), but not in cells with circles; aside from that, no cell can be visited more than once. No crossings or unused cells are given.

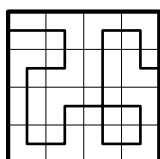
There are additional rules in seven categories. Each grid must conform to exactly one rule from each category, and each rule must apply to exactly two grids. To find out which rules are assigned to each grid is part of the puzzle.

Note: In some categories it is possible that single clues might conform to several rules of that category. This is allowed. However, for each grid there can be only one rule that fits all clues of the same kind.

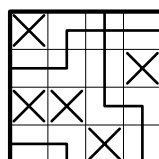
The rules are represented by the following icons:

Category 1: General – Global Rules

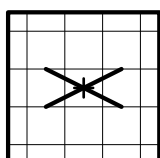
This category contains rules about global properties, namely restrictions on crossings and unused cells.



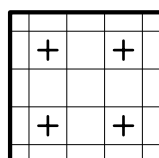
The loop must pass through all cells.



Each row and column must contain at least one cell that is not used by the loop.



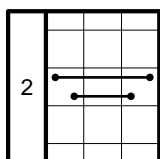
The loop cannot cross itself.



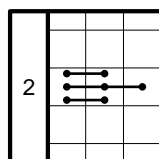
The loop must cross itself at least once, but cells with crossings cannot touch each other, not even diagonally.

Category 2: Numbers Left – Segments

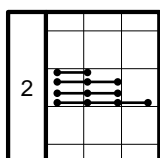
This category deals with clue numbers on the left side of the grid. These clues refer to horizontal loop segments in the respective row. A line connecting two adjacent cells is defined as length 1.



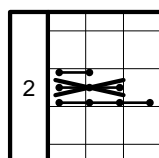
Each clue number indicates how many separate horizontal loop segments appear in the respective row.



Each clue number indicates the length of the longest loop segment in the respective row.



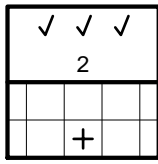
Each clue number indicates the length that appears most often in the respective row. No other length can appear the same number of times.



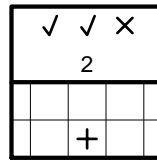
Each clue number indicates a length that is not found in the respective row.

Category 3: Numbers Above – Crossings

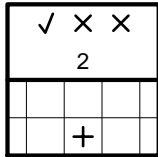
This category deals with clue numbers above the grid. There are exactly three such clue numbers in each grid. These clues indicate the number of crossings in the respective column. However, not all of these numbers are correct.



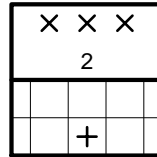
All three clue numbers are correct.



Exactly two clue numbers are correct.



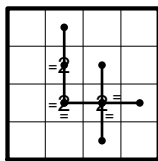
Exactly one clue number is correct.



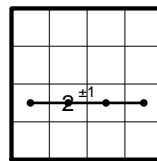
None of the clue numbers is correct.

Category 4: Numbers Inside – Geradeweg

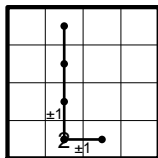
This category deals with clue numbers inside the grid. These numbers are Geradeweg clues: a number indicates the length of the loop segment passing through its cell. If the loop makes a turn or crosses itself in a cell with a number, both segments must have the respective length. However, some clues are Knapp Daneben, which means that each clue number is either 1 higher or 1 lower than the actual length of the loop segments. If the loop makes a turn or crosses itself in a Knapp Daneben clue number, the horizontal and vertical loop segments may have the same or different length.



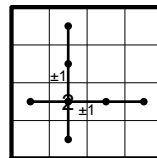
All clue numbers indicate the correct length (no Knapp Daneben). The loop may pass straight through, turn or cross itself in a clue cell.



All clue numbers are Knapp Daneben, and the loop must pass straight through all clue cells without crossing itself there.



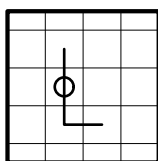
All clue numbers are Knapp Daneben, and the loop must make a turn in all clue cells.



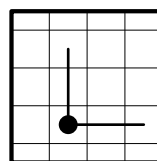
All clue numbers are Knapp Daneben, and the loop must cross itself in all clue cells.

Category 5: Circles – Masyu

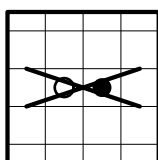
This category deals with circles inside the grid. Some circles have Masyu properties. In all grids all circles look the same, the colours are just descriptions of the Masyu rules: A white Masyu circle means that the loop passes straight through the circle and makes a turn in at least one of the cells immediately before or after the circle. A black Masyu circle means that the loop makes a turn in the circle and passes straight through (with or without crossing itself) the cells immediately before and after the circle. Some circles have neither property, they are not valid Masyu circles of either colour.



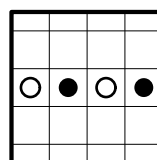
All circles are white Masyu circles.



All circles are black Masyu circles.



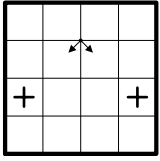
All circles are neither white nor black Masyu circles.



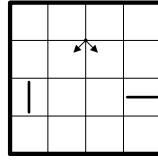
All circles are white or black Masyu circles, and along the loop white and black circles alternate (the loop never passes through two circles of the same colour consecutively).

Category 6: Arrows – Myopia

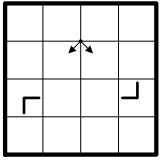
This category deals with diagonal arrows inside the grid. These clues are Myopia-like arrows. From each grid point with one or more arrows, these arrows point to the nearest cells in the four diagonal directions that have a certain property. If there is no arrow in a specific direction, then the nearest cell with the specified property is farther away, or there may be no such cell in the given direction at all.



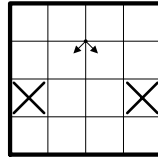
The arrows point to the nearest cells in the four diagonal directions where the loop crosses itself.



The arrows point to the nearest cells in the four diagonal directions where the loop passes straight through.



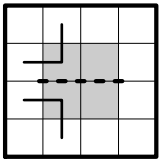
The arrows point to the nearest cells in the four diagonal directions where the loop makes a turn.



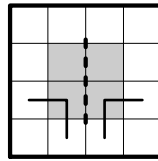
The arrows point to the nearest cells in the four diagonal directions that are not used by the loop.

Category 7: Grey Regions – Symmetry

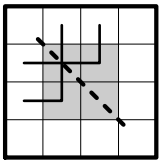
This category deals with grey regions. All such regions are 2×2 squares. Each such region must have an axis of symmetry. Aside of this, there are no restrictions on the loop; grey regions may contain crossings and unused cells, even completely empty regions are allowed. Symmetry refers only to the loop, not to additional elements (circles, arrows, numbers).



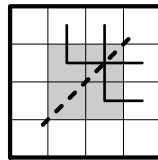
In all regions, the axis of symmetry must run horizontally.



In all regions, the axis of symmetry must run vertically.



In all regions, the axis of symmetry must run diagonally, from top left to bottom right.

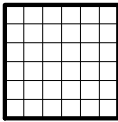
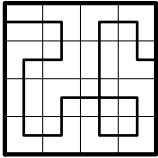
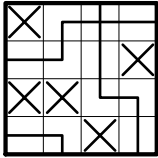
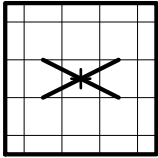
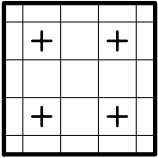
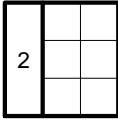
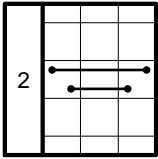
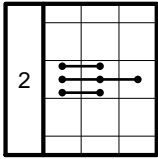
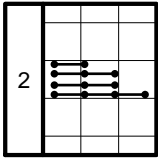
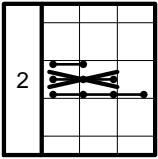
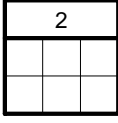
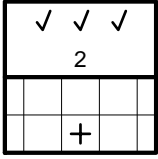
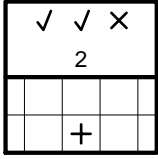
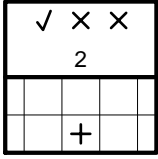
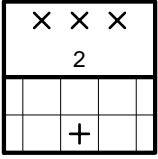
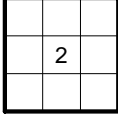
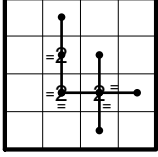
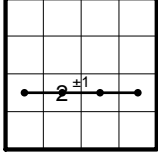
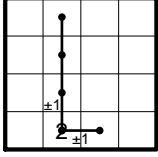
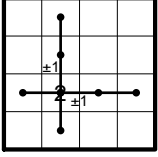
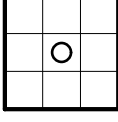
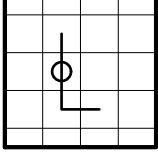
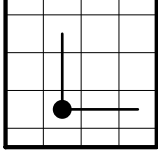
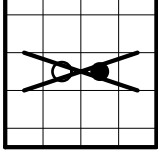
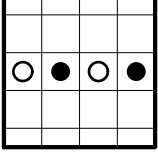
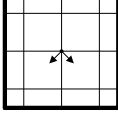
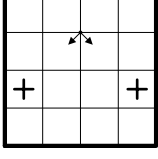
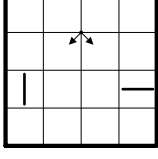
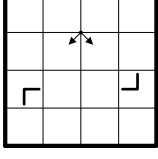
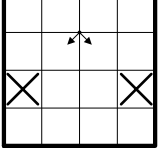
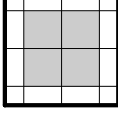
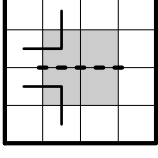
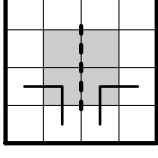
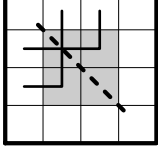
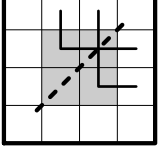


In all regions, the axis of symmetry must run diagonally, from bottom left to top right.

During the competition, each team will receive a table exactly as the one on the next page. The puzzle grids are labeled with letters from A to H. When you have identified a specific rule in a puzzle grid, enter the respective letter below the icon representing this rule. In a completely solved puzzle, there will be two letters below each icon.

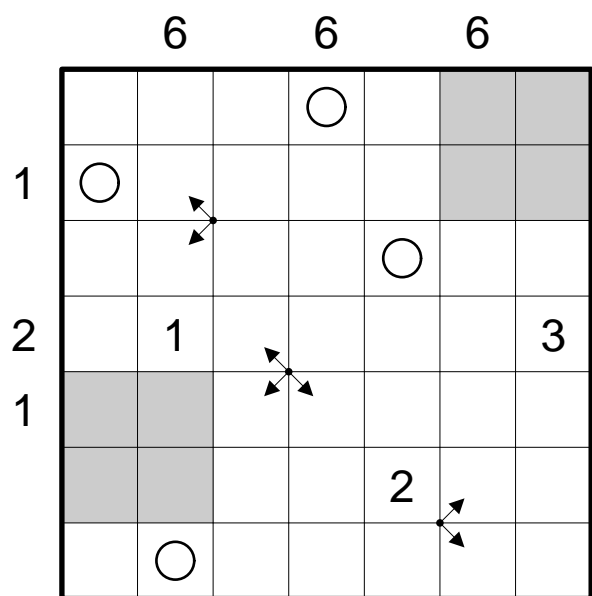
Scoring: Teams receive points for correctly identified rules. Every correct letter is worth 40 points, and every correctly solved puzzle is worth 90 points. However, if there are more than two letters below an icon, these letters will yield 0 points, even if one or two of them are correct. Similarly, if a letter appears below two icons in the same category, this letter will yield 0 points in this category, even if it is entered below the correct icon.

All puzzle grids may have multiple solutions with different rule combinations. However, there is only one solution for all puzzle grids simultaneously, and only solutions and rules that are part of this full solution will yield any points.

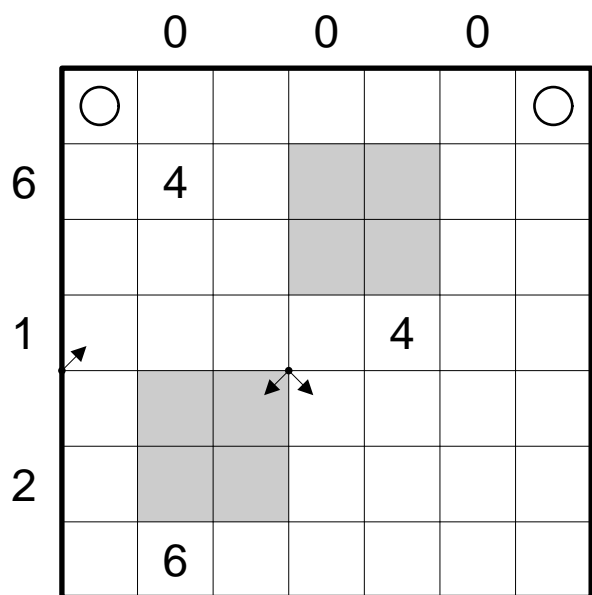
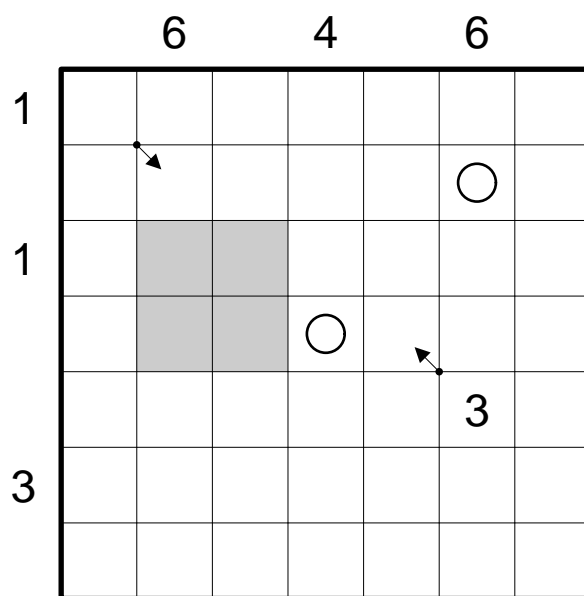
 <p>General: Global Rules</p>				
 <p>Numbers Left: Segments</p>				
 <p>Numbers Above: Crossings</p>				
 <p>Numbers Inside: Geradeweg</p>				
 <p>Circles: Masyu</p>				
 <p>Arrows: Myopia</p>				
 <p>Grey Regions: Symmetry</p>				

Example (with four puzzle grids only; each rule must be used in exactly one grid):

A

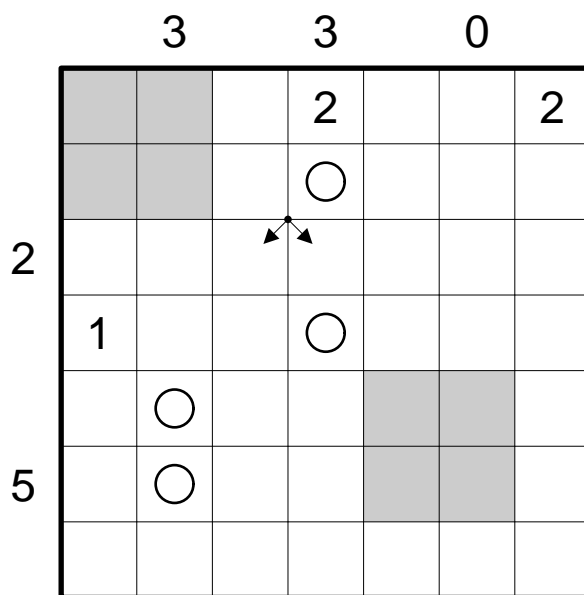


B

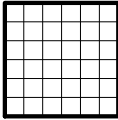
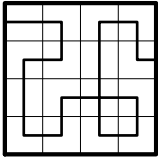
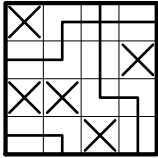
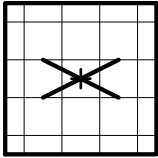
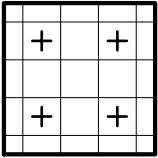
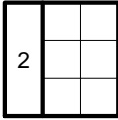
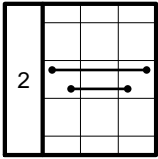
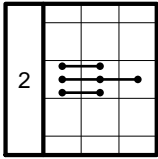
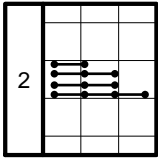
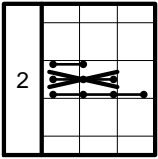
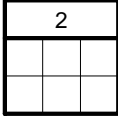
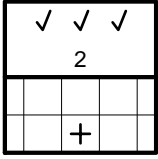
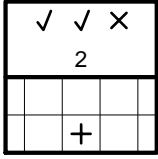
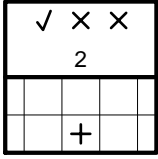
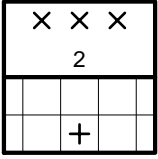
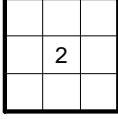
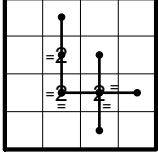
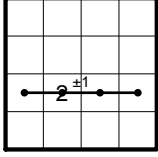
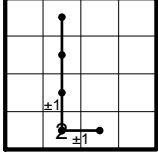
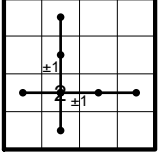
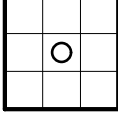
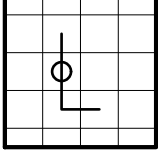
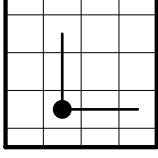
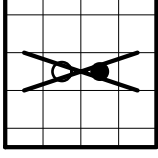
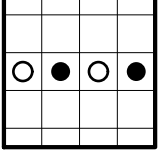
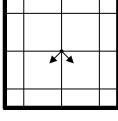
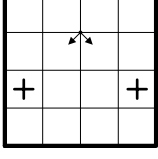
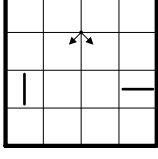
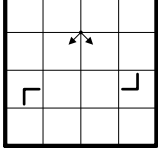
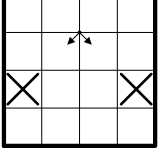
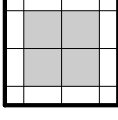
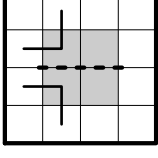
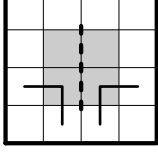
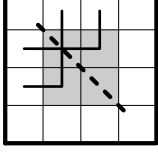
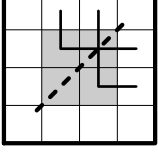


C

D

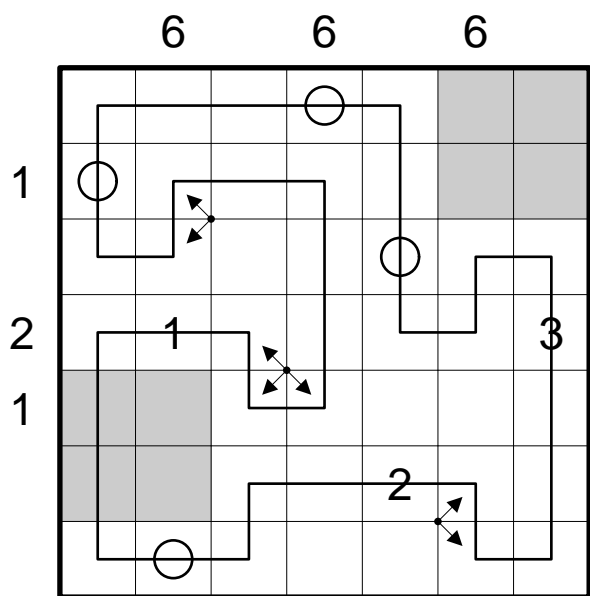


The next pages contain the solutions of the example, both the completed table and the solved puzzles.

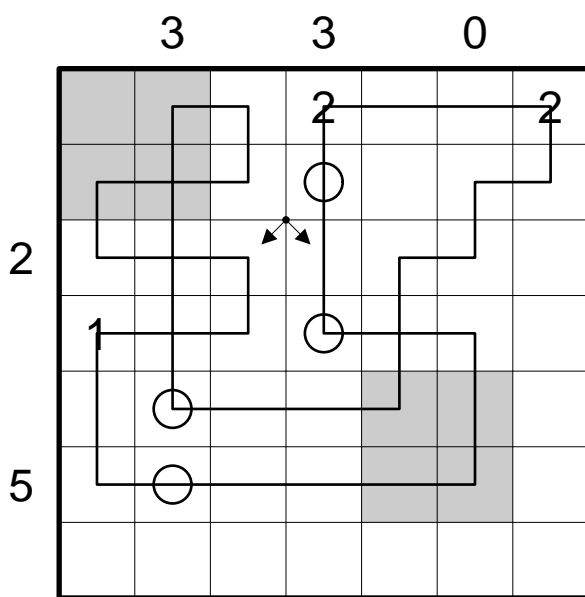
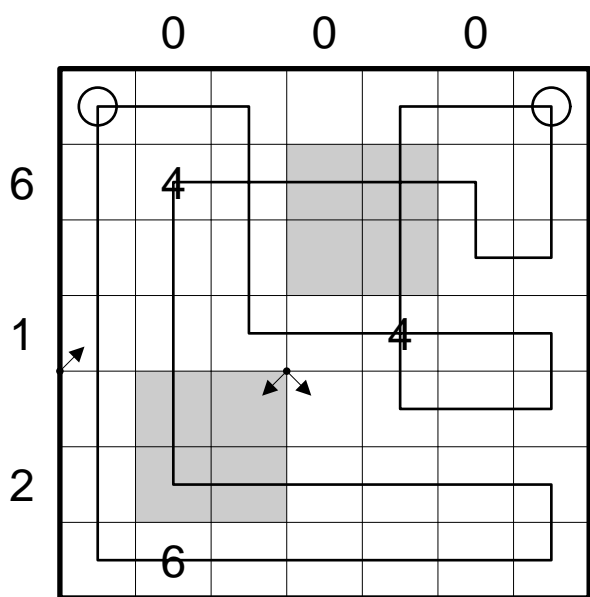
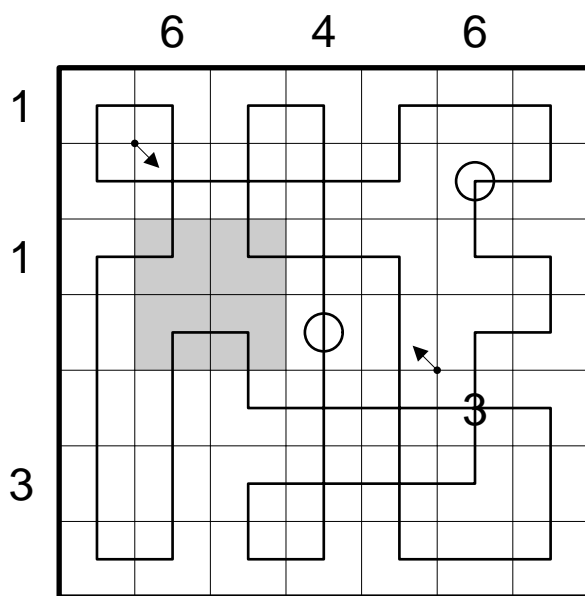
 General: Global Rules	 B	 D	 A	 C
 Numbers Left: Segments	 A	 D	 B	 C
 Numbers Above: Crossings	 C	 D	 B	 A
 Numbers Inside: Geradeweg	 C	 A	 D	 B
 Circles: Masyu	 A	 C	 B	 D
 Arrows: Myopia	 D	 B	 A	 C
 Grey Regions: Symmetry	 A	 B	 D	 C

Solution of the example puzzles:

A



B



C

D