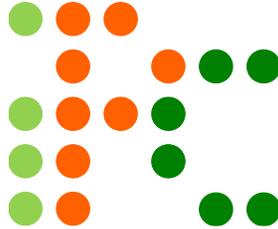


# puzzle Ramayan

and



Episode – 2  
21<sup>st</sup> – 25<sup>th</sup> February 2020

Number and Object Placement  
by  
Harmeet Singh and Pranav Kamesh

Puzzle Ramayan rounds will also serve as qualifiers for Indian Puzzle Championship for year 2020. Please check <http://logicmastersindia.com/PR/2020pr.asp> for details.

## Important Links

Submission Page : <http://logicmastersindia.com/PR/202002/>

Discussion Thread : <http://logicmastersindia.com/t/?tid=2728>

F. A. Q. : <http://logicmastersindia.com/t/?tid=381>

Registration, if required : <http://logicmastersindia.com/register.asp>

---

## About this Episode

This episode has 22 Puzzles from the following puzzle types:

- 3\* Futoshiki
- 3\* Kropki
- 3\* Ripple Effect
- 2\* Kropshiki
- 3\* Battleships
- 3\* Akari
- 3\* Polyominoes
- 2\* Loaded Battleships

## How to participate?

- Understand the rules of different puzzles that will appear in this episode. This Instruction Booklet has rules for each puzzle.
- Download the password protected Puzzle booklet (will be uploaded before the test starts). The Puzzle booklet contains the actual Puzzles to be solved. It is password protected, so you won't be able to open it.
- Any time on or after 21<sup>st</sup> February (but on or before 25<sup>th</sup> February), login at the submission page using your LMI userid and password. Please check the submission page for exact timing.
- Click on "Start". At this time, password for pdf will be shown and timer will start.
- The puzzle booklet should be downloaded, printed and solved on paper.
- There will not be any interface / applet to solve the puzzles on web browser.
- Most of the puzzles are designed to be solved faster on paper.
- We advise you to have a printer accessible with enough paper.
- Outside solving help of any kind is not permitted. This includes but is not limited to: assistance of any kind from any other person; prepared notes, books, calculators, computers, or tools other than items explicitly permitted.
- You are allowed to use writing implements, eraser, blank paper (including commercial graph paper), ruler, scissors, and tape.

If you are participating at LMI for first time, you must check the F.A.Q. at <http://logicmastersindia.com/t/?tid=381>.

## About answer keys and Submission

- Each puzzle has some answer keys, as described in the instructions.
  - After solving the puzzle, you need to submit the puzzle using the answer keys.
  - You may submit the answer keys anytime during the test duration. You may consider submitting a puzzle as soon as you solve it.
  - Answer keys are always to be entered from left to right or top to bottom
  - Don't enter any separator unless specified in the answer key
  - If one row and one column is marked, enter the row first and then the column
  - If multiple rows are marked, enter from top to bottom for marked rows
  - If multiple columns are marked, enter from left to right for marked columns
  - If horizontal and vertical keys are needed, first enter the horizontal and then the vertical
  - Uppercase or lower case of answer key does not matter
  - Characters other than alphabets, numbers and comma will be removed while checking the answer
-

## Points Table and Scoring

Points typically indicate difficulty of the Puzzles and time required to solve them. You will get full points if you enter the correct answer key. While the organizers have made best efforts to match them, your personal experience and preference may differ.

Futoshiki	2, 3, 5
Kropki	2, 6, 8
Ripple Effect	4, 5, 8
Kropshiki	3, 6
Battleships	2, 5, 7
Akari	2, 4, 2
Polyominoes	4, 10, 3
Loaded battleships	2, 7

This test uses instant grading where a solver can submit any individual Puzzle and receive confirmation that the solution is correct or not. Each incorrect submission reduces the puzzle's potential score. The first, second, third, and fourth incorrect submissions reduce the potential score to 90%, 70%, 40%, and 0% respectively.

## Bonus and Ranking

If you submitted all Puzzles correctly, you can have bonus points 1 point per minute saved, computed up to seconds.

Ranking will be based on following rules in order:

1. Most total points
2. Earliest final submission time, up to seconds (ignoring incorrect submissions)

## About the Puzzle Booklet

The password protected Puzzle booklet will have 10 pages. We expect you to print and solve on paper, so you would need to have a printer accessible with enough paper.

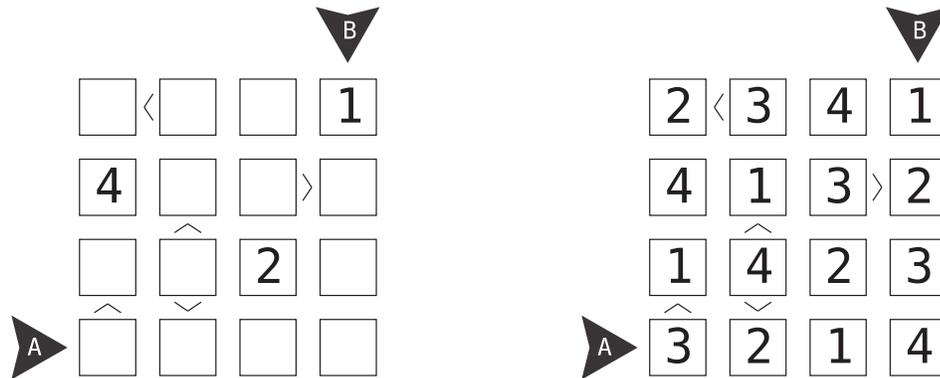
---

## 1-3 Futoshiki

2 + 3 + 5 points

Place a digit from 1 to N into each of the empty cells so that each digit appears exactly once in each row and column. If '<' or '>' is present between adjacent cells, the arrow points to the smaller number of the two.

Puzzles in the contest will be of grid sizes 6x6, 6x6 and 7x7.  
This example is of grid size 4x4.



**Answer Key:** For each marked row (or column), enter the contents of the row (or column) from left to right (or top to bottom).

Example: 3214, 1234

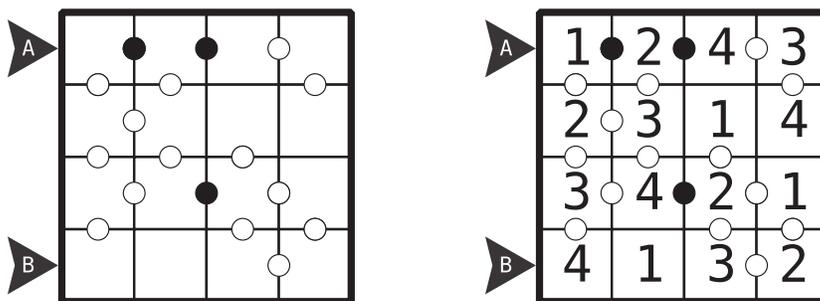
## 4-6 Kropki

2 + 6 + 8 points

Fill in the grid with digits 1–N where N is the size of the grid. Each row and column contains each digit exactly once. If two consecutive digits appear in two neighbouring cells, they are separated by a white dot. If the digit in a cell is half of the digit in a neighbouring cell, then they are separated by a black dot. The dot between 1 and 2 can either be white or black.

**All possible dots are marked.**

Puzzles in the contest will be of grid sizes 6x6, 7x7 and 9x9.  
This example is of grid size 4x4.



**Answer Key:** For each marked row (or column), enter the contents of the row (or column) from left to right (or top to bottom).

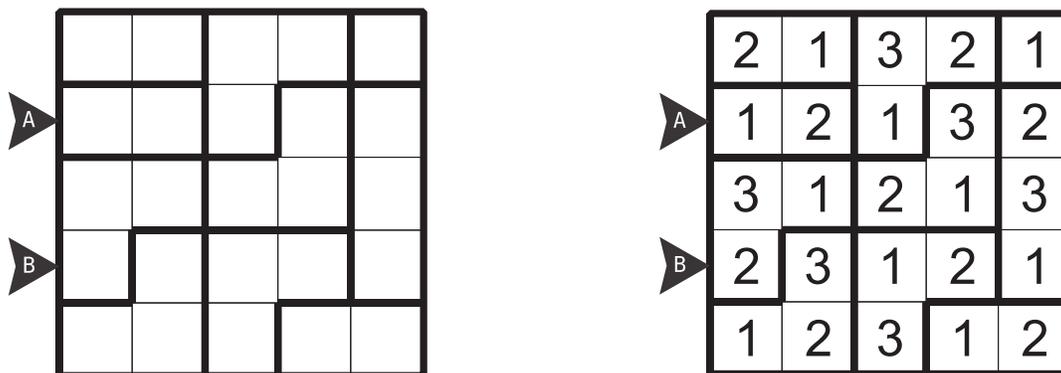
Example: 1243, 4132

## 7-9 Ripple Effect

4 + 5 + 8 points

Place digits 1 to N in each thickly outlined region, where N equals the size of the region. Same digits in the same row or column must be separated by at least a number of cells equal to that digit.

Puzzles in the contest will be of grid sizes 7x7, 7x7 and 8x8. This example is of grid size 5x5.



Answer Key: For each marked row (or column), enter the contents of the row (or column) from left to right (or top to bottom).

Example: 12132, 23121

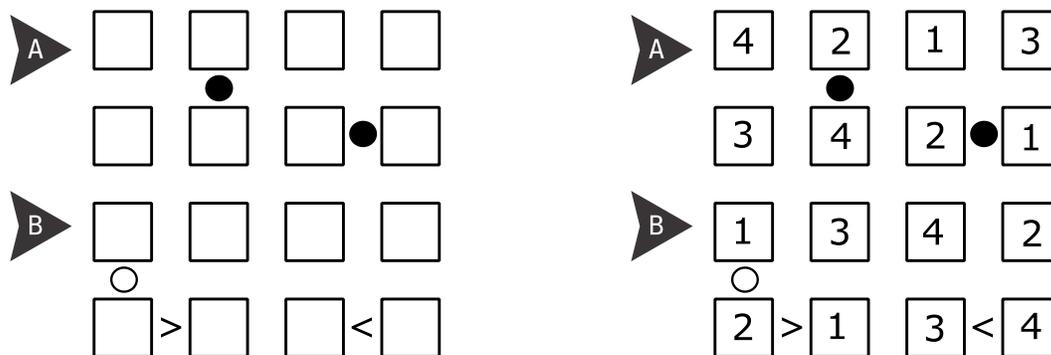
## 10-11 Kropshiki

3 + 6 points

Place a digit from 1 to N into each of the empty cells so that each digit appears exactly once in each row and column. If '<' or '>' is present between adjacent cells, the arrow points to the smaller number of the two. If a white dot separates two neighbouring cells, the two digits must be consecutive. If a black dot separates two neighbouring cells, the digit in one cell is half of the digit in the other cell.

All possible dots are NOT marked.

Puzzles in the contest will be of grid sizes 6x6 and 7x7. This example is of grid size 4x4.



Answer Key: For each marked row (or column), enter the contents of the row (or column) from left to right (or top to bottom).

Example: 4213, 1342

# 12-14 Battleships

2 + 5 + 7 points

Place the given fleet of ships with the shapes of the ships as shown. Each segment of a ship occupies a single cell. Ships can be rotated. Ships cannot touch each other, not even diagonally. Some cells are known to be water and are indicated by waves. Some ship segments may already be given.

The numbers outside the grid indicate the number of cells occupied by ships in that row or column.

Puzzles in the contest will have grid sizes 7x7, 10x10, and 10x10. The example below has grid size 8x8.

Answer Key: For each row from top to bottom, enter the column position of the leftmost ship segment. Enter - if there are no ships in the row.

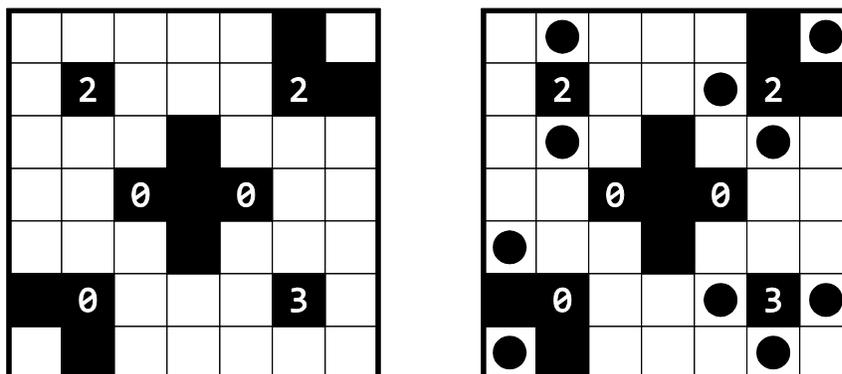
Example: AEC-EAEA

## 15-17 Akari

2 + 4 + 2 points

Place lightbulbs in some of the white cells so that all white cells are illuminated. Lightbulbs illuminate all cells they can see horizontally and vertically, including the cell in which it is placed. Lightbulbs are blocked by black cells or the edge of the grid. No two lightbulbs may illuminate each other. Numbers in black cells indicate how many orthogonally adjacent cells contain a lightbulb.

Puzzles in the contest will be of grid sizes 6x12, 8x8 and 9x9. The example below is of grid size 7x7.



Answer Key: Enter the number of light bulbs for each row, from top to bottom. If there are no bulbs in a row, enter 0.

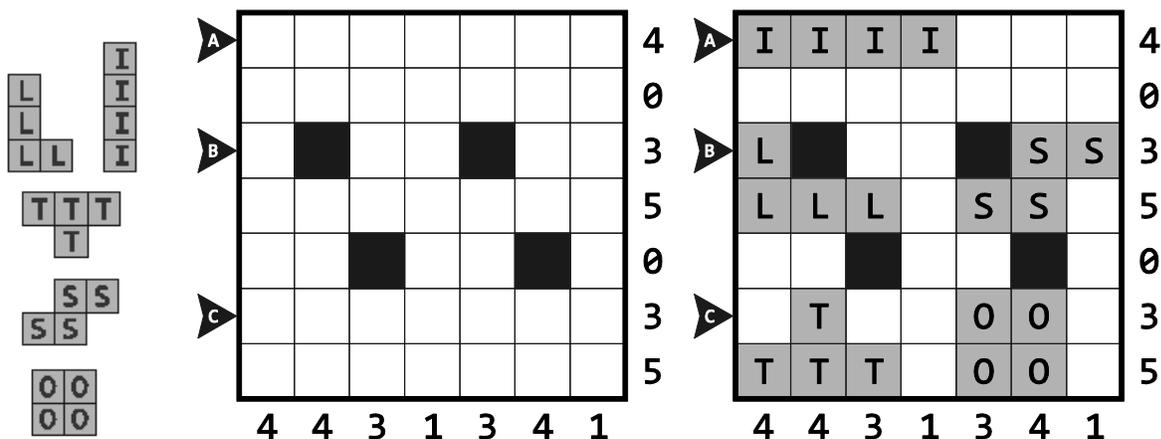
Example: 2120122

## 18-20 Polyominoes

4 + 10 + 3 points

Place the given set of polyominoes in the grid. Polyominoes do not touch each other, not even diagonally. Rotations and reflections are allowed. Polyominoes cannot be placed in shaded cells. The numbers outside the grid indicate the number of cells occupied by polyominoes in that row or column.

The polyominoes in the contest will be tetrominoes, pentominoes and custom shapes. This example uses tetrominoes.



Answer Key: For each marked row/column, enter the contents of the cells. Use the given letters for polyominoes and - for other cells.

Example: IIII---, L----SS, -T---OO-

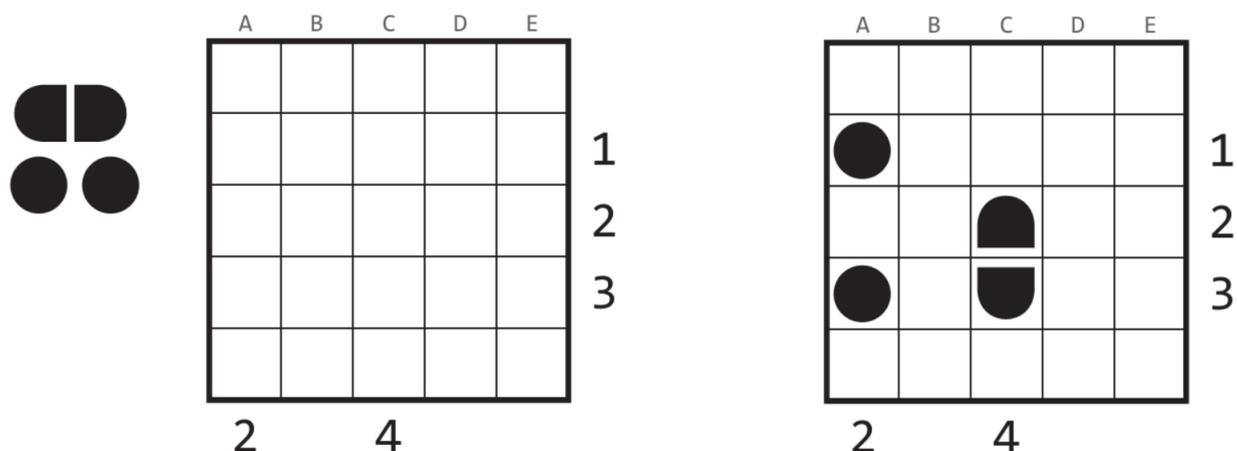
## 21-22 Loaded battleships

2 + 7 points

Place the given fleet of ships with the shapes of the ships as shown. Each segment of a ship occupies a single cell. Ships can be rotated. Ships cannot touch each other, not even diagonally. Some cells are known to be water and are indicated by waves. Some ship segments may already be given.

A ship of size  $N$  (number of cells) contains a weight  $N$  for each ship segment (each cell). The numbers outside the grid indicate the sum of weights for cells occupied by ships in that row or column.

The puzzles in the contest will have grid sizes  $6 \times 6$  and  $8 \times 8$ . The example below has grid size  $5 \times 5$ .



**Answer Key:** For each row from top to bottom, enter the column position of first ship segment. Enter - if there are no ships in the row.

Example: -ACA-