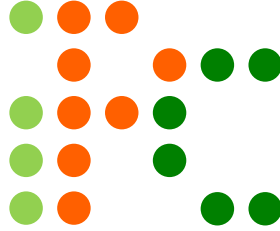


# puzzle Ramayan

and



Episode – 6  
17<sup>th</sup> – 22<sup>nd</sup> June 2022

MII & Object Placement  
by  
Priyam Bhushan & Chandrachud Nanduri

Puzzle Ramayan rounds will also serve as qualifiers for Indian Puzzle Championship for year 2022. Please check <http://logicmastersindia.com/PR/2022pr.asp> for details.

## Important Links

Submission Page : <http://logicmastersindia.com/live?contest=PR202206>

Discussion Thread : <http://logicmastersindia.com/t/?tid=3036>

F. A. Q. : <http://logicmastersindia.com/t/?tid=2773>

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

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## About this Episode

This episode has 22 Puzzles from the following puzzle types:

- 3\* Balance Loop
- 3\* Heterocut
- 3\* Consecutive Quads
- 3\* Akari
- 3\* Minesweeper
- 3\* Polyominoes
- 2\* Balance Loop [Unequal Lengths]
- 2\* Polyominoes [Minesweeper]

## How to participate?

- Understand the rules of different puzzles that will appear in this episode. This Instruction Booklet has rules for each puzzle.
- Any time on or after 17<sup>th</sup> June (but on or before 22<sup>nd</sup> June), login at the submission page using your LMI user-id and password. Please check the submission page for exact timing.
- **If you plan to solve on paper:**
  - a) 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.
  - b) Click on "Start". At this time, password for pdf will be shown and timer will start. **The contest duration is 60 minutes.**
  - c) The puzzle booklet can be downloaded, printed and solved on paper.
  - d) We advise you to have a printer accessible with enough paper.
  - e) You are allowed to use writing implements, eraser, blank paper (including commercial graph paper), ruler, scissors, and tape.
- **If you plan to solve on LMI's Penpa-Integrated Interface:**
  - a) Click on this link and understand the instructions - <https://logicmastersindia.com/live/faq-online-solving.asp>
  - b) It is noted on the link too, but we note it here as well to be clear – the participants must still input the answer keys in the boxes below the puzzle and submit them to receive credit as given below.
- 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.
- Participants may use both paper solving and online solving, even interchangeably. Eventually our system will only count anything submitted in the submission boxes in either mode.

If you are participating at LMI for first time, it will be useful to check the F.A.Q. at <http://logicmastersindia.com/t/?tid=2773>.

## 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.
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- If multiple columns are marked, enter from left to right for marked columns.
- Uppercase or lower case does not matter for answer keys where letters must be entered.
- Characters other than the ones explicitly expected by the answer key will cause the red highlight to appear around the submission box.

## 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.**

Balance Loop	1,3,10
Heterocut	4,9,3
Consecutive Quads	4,10,6
Akari	1,2,2
Minesweeper	1,5,3
Polyominoes	6,3,4
Balance Loop [Unequal Lengths]	3,6
Polyominoes [Minesweeper]	6,8

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. A demonstration for this is shown below.

### Original points

04 Araf	50 points	4A	Sum should be 10
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### Potential points after 1 incorrect submission

04 Araf	45 / 50	4A	1234
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### Potential points after 2 incorrect submissions

04 Araf	35 / 50	4A	23311
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### Potential points after 3 incorrect submissions

04 Araf	20 / 50	4A	111111111
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### Potential points after 4 incorrect submissions

04 Araf	0 / 50	4A	541
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## 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)

### Credits

- **Murat Can Tonta, David Altizio (A.K.A. djmathman) & Jacob Cohen (A.K.A. Conflux)** for test solving the puzzles and providing invaluable feedback.

- The original creator **opt-pan** for penpa edit - <https://opt-pan.github.io/penpa-edit/>

- **Swaroop Guggilam** for his recent efforts in adding features to Penpa-edit - <https://swaroopg92.github.io/penpa-edit/> and also working to integrate it with our contest engine.

### About the Puzzle Booklet

The password protected Puzzle booklet will have 10 pages. This is relevant only for paper solvers.

*Solutions and keys (including the key explanation) to examples are towards the end of the booklet in the Solutions section.*

### 1-3 Balance Loop

1 + 3 + 10 points

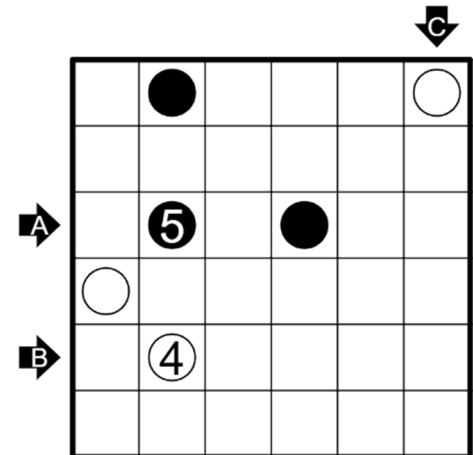
Draw a non-intersecting loop through the centers of some cells that passes through every circle.

The straight line segments coming out of a white circle must have equal length, while the straight line segments coming out of a black circle must have different lengths.

The sum of the lengths of these two line segments must equal the number in the circle, if given.

[The puzzles in the contest will be of sizes 7x7, 10x10 and 11x11. This example is 6x6.]

Penpa for example: <https://tinyurl.com/24atj8pv>



### 4-6 Heterocut

4 + 9 + 3 points

Divide the grid into regions of orthogonally connected cells, each containing a number of cells within the range given outside the grid.

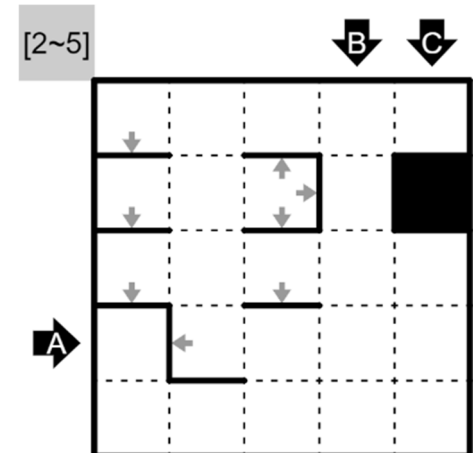
No two regions may be the same size and shape, counting rotations and reflections as the same.

Borders must separate two different regions, and an arrow on a border always points toward the larger of the two regions.

Black cells are not part of any region.

[The puzzles in the contest will be of sizes 6x6, 7x7 and 8x8. This example is 5x5.]

Penpa for example: <https://tinyurl.com/254s3dsd>



### 7-9 Consecutive Quads

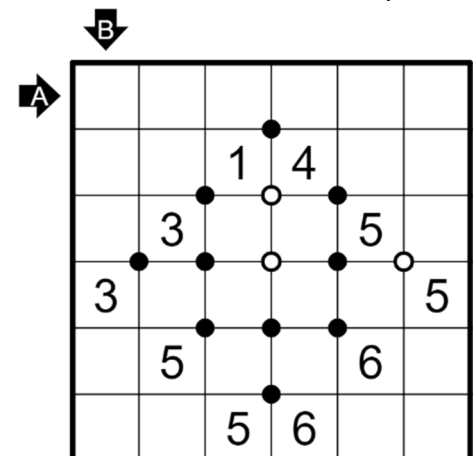
4 + 10 + 6 points

Place a number from 1 to N into each cell so that each row and column contains every number from that range with no repeats, where N is the side length of the grid.

A white dot indicates that exactly one pair of the cells it touches contains consecutive numbers. A black dot indicates that at least two pairs of the cells it touches contain consecutive numbers.

[The puzzles in the contest will be of sizes 5x5, 6x6 and 6x6. This example is 6x6.]

Penpa for example: <https://tinyurl.com/27sus2q5>



## 10-12 Akari

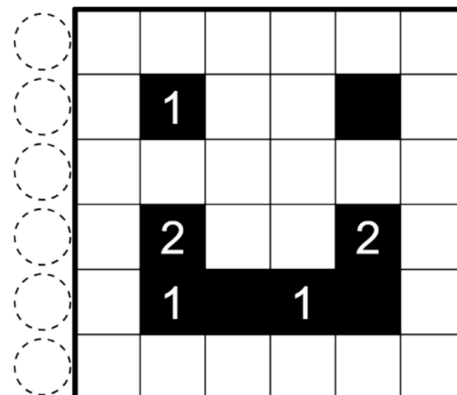
1 + 2 + 2 points

Place lights in some cells so that every cell is illuminated. Lights illuminate the cell they're in as well as all cells seen in a straight line horizontally or vertically, not obstructed by a black cell. Lights may not illuminate each other.

Clues represent the number of lights in the (up to) four cells surrounding the clue.

[The puzzles in the contest will be of sizes 8x8, 9x9 and 11x11. This example is 6x6.]

Penpa for example: <https://tinyurl.com/2764q7dv>



## 13-15 Minesweeper

Place mines into some empty cells so that each clue has the indicated number of mines in the (up to) eight surrounding cells.

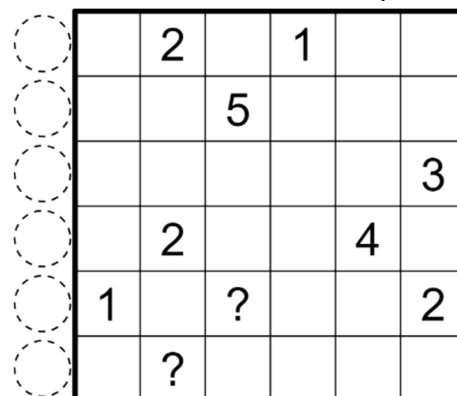
The total number of mines to be placed are noted below the grid.

A “?” stands for any **whole** number.

[The puzzles in the contest will be of sizes 7x7, 9x9 and 10x10. This example is 6x6.]

Penpa for example: <https://tinyurl.com/23p79ft6>

1 + 5 + 3 points



● = 10

## 16-18 Polyominoes

Place Polyominoes into the grid from the given bank. All polyominoes from the bank must be placed exactly once, and can be rotated and/or reflected.

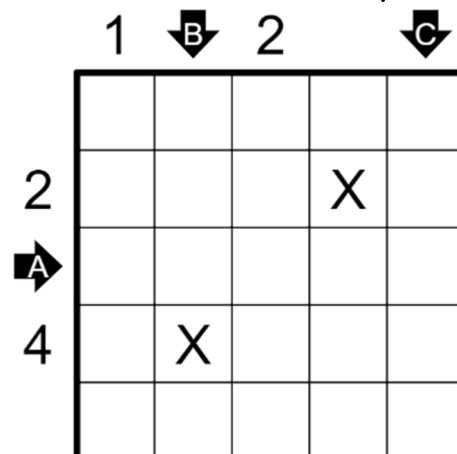
Polyominoes cannot share an edge or a corner. They cannot be placed in cells marked with an “X”.

The numbers outside the grid give the number of cells containing a polyomino piece in that direction.

[The puzzles in the contest will be of sizes 8x8, 9x9 and 10x10. This example is 5x5.]

Penpa for example: <https://tinyurl.com/293du46t>

6 + 3 + 4 points



## 19-20 Balance Loop [Unequal Lengths]

3 + 6 points

Draw a non-intersecting loop through the centers of some cells that passes through every circle.

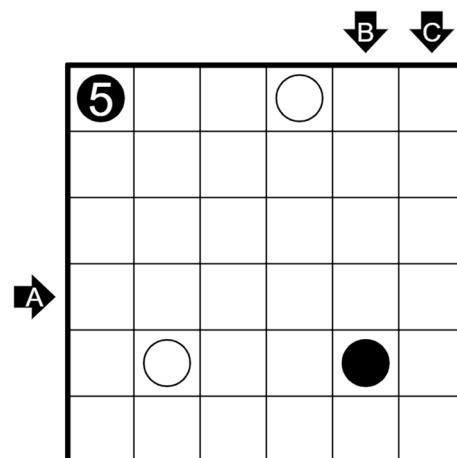
The straight line segments coming out of a white circle must have equal length, while the straight line segments coming out of a black circle must have different lengths.

The sum of the lengths of these two line segments must equal the number in the circle, if given.

Additionally, no two consecutive straight line segments may be the same length.

[The puzzles in the contest will be of sizes 8x8 and 9x9. This example is 6x6.]

Penpa for example: <https://tinyurl.com/2248wrba>



## 21-22 Polyominoes [Minesweeper]

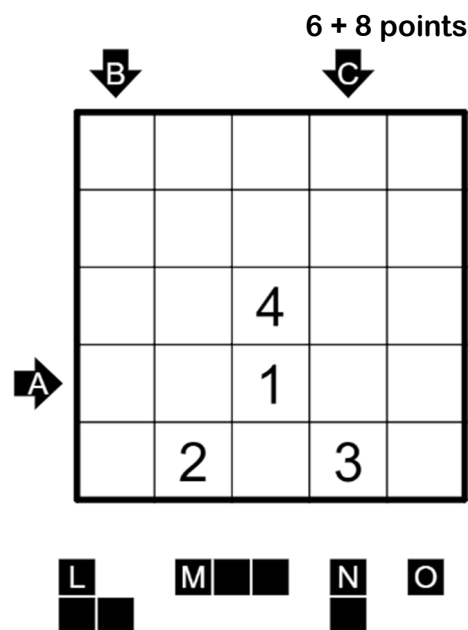
Place Polyominoes into the grid from the given bank. Polyominoes can be rotated and/or reflected. **Polyominoes cannot share an edge or a corner.**

It is not necessary that all Polyominoes appear in the grid, each one appears at most once.

Each clue has the indicated number of Polyomino pieces in the (up to) eight surrounding cells.

[The puzzles in the contest will be of sizes 10x10 and 13x13. This example is 5x5.]

Penpa for example: <https://tinyurl.com/27hx7l46>



## Solutions

For this round, all answer keys will NOT be the same for all puzzles.

The keys are given section by section.

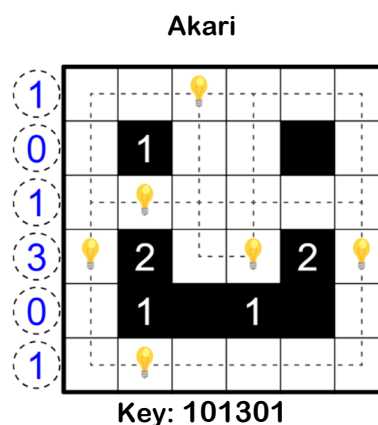
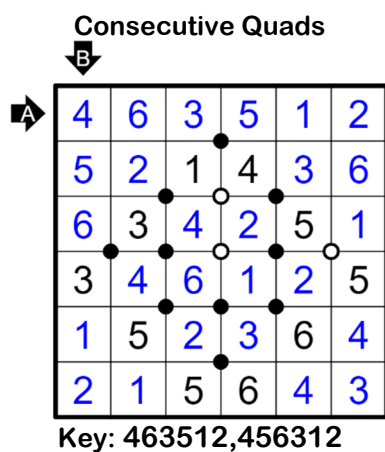
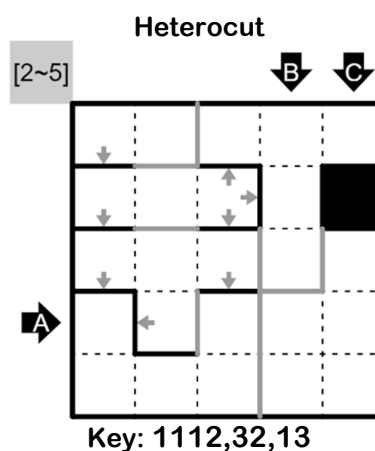
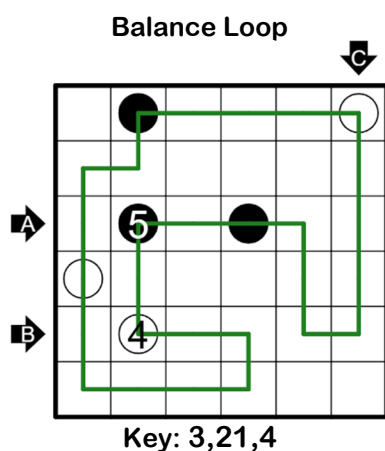
**Balance Loop, Balance Loop [Unequal Lengths]** – For each marked row/column, enter the lengths of all loop segments in the direction of the arrow. Enter 0 if there are none.

**Heterocut** – For each marked row/column, enter the number of consecutive cells belonging to separate regions in the direction of the arrow. Ignore black cells.

**Consecutive Quads** – For each marked row/column, enter the digits in the direction of the arrow, including given digits if any.

**Akari, Minesweeper** – For each row from top to bottom, enter the number of lights/mines.

**Polyominoes, Polyominoes [Minesweeper]** – The polyominoes in the bank will be labeled. For each marked row/column, enter the labeling once for each separate polyomino that appears in at least one cell in that direction. Enter 0 if no Polyomino appears.



Minesweeper

● = 10  
Key: 124111

Polyominoes

Key: 0,L,NM

Balance Loop [Unequal Lengths]

Key: 1,5,0

Polyominoes [Minesweeper]

Key: NL,N,ML

**Origin Credits for Made In India section**

Balance Loop – Prasanna Seshadri

Heterocut – Anurag Sahay

Consecutive Quads – Ashish Kumar