# Connect the Dots:
# Logic Puzzles of the Slitherlink & Masyu variety

## 1 Why Logic Puzzles?

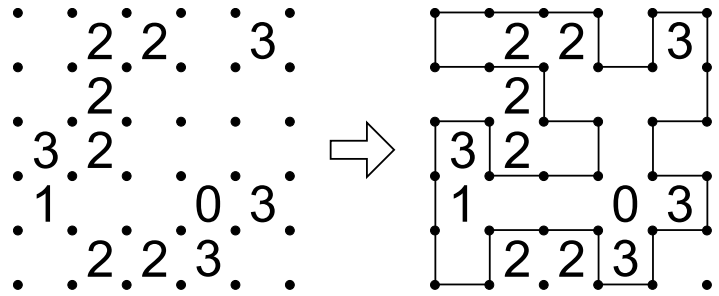
Logic puzzles are similar to math problems (that you encounter in competitions and other events) in many ways:

1. There is one unique answer.
2. Usually, there is a brute force way to solve the problem. (guess and check....)
3. Usually, there is a logical way to solve the problem. (although you might not know enough math/strategies to do it this way...)

## 2 Slitherlink/Fences

### 2.1 Introduction

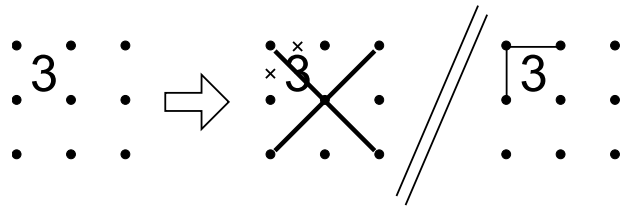
The goal in Slitherlink is to draw a single closed loop composed of vertical and horizontal segments. These segments must be on the rectangular lattice defined by the points. Some "squares" have numbers, which indicate how many of the 4 adjacent segments are part of the loop.



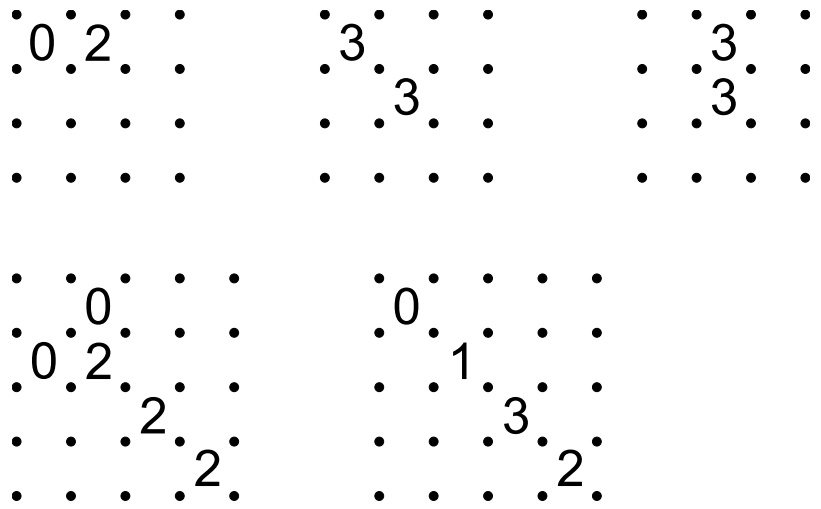
### 2.2 Tips/Strategies

1. Mark unused segments.

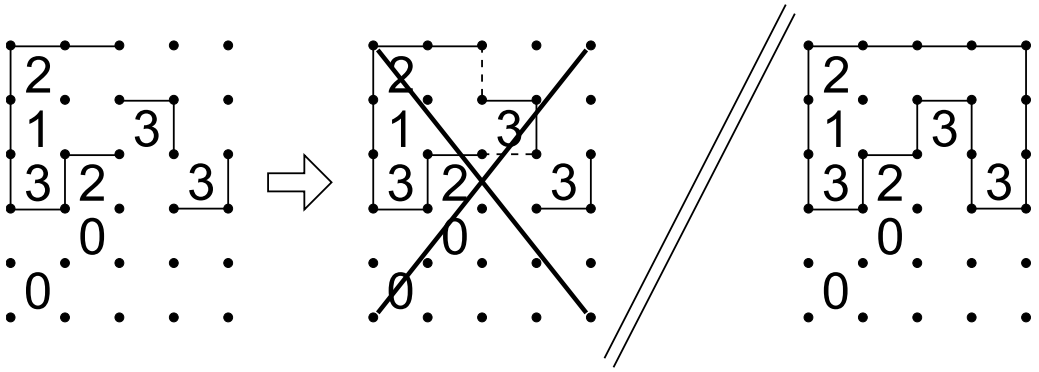
2. Each point is part of exactly 0 or 2 edges:



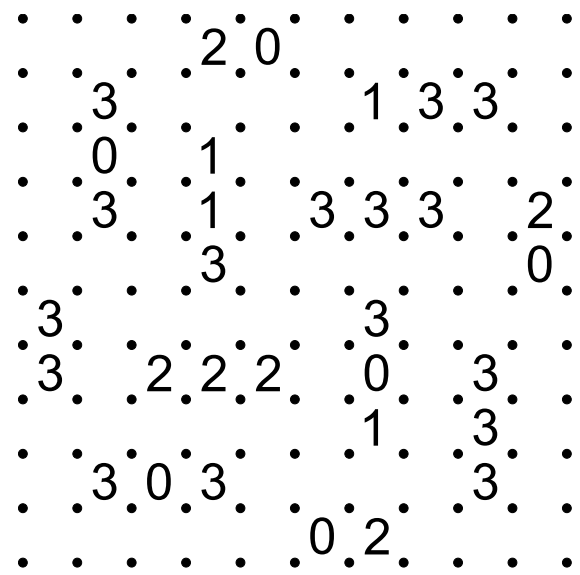
3. Recognize patterns of adjacent (orthogonal or diagonal) clues and clues near the edge of the board.



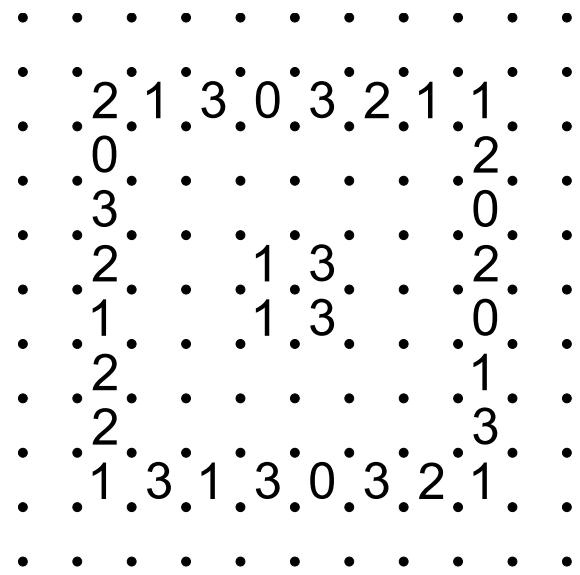

4. Don't close loops (until the end). This means that the loop cannot self-intersect, and that regions must be connected orthogonally.



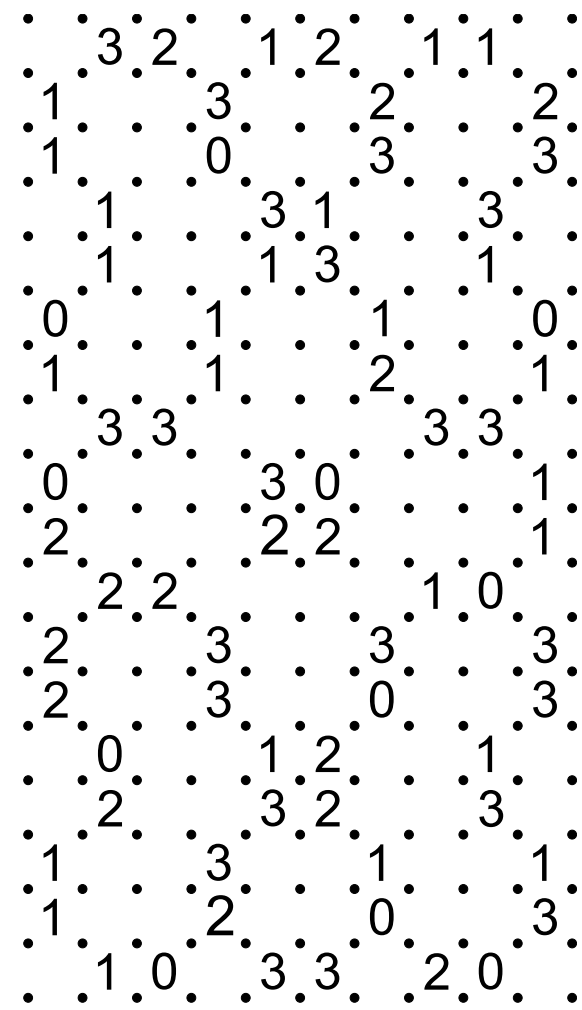
### 2.3 Exercises



(#1 from Slitherlink & Masyu, Nikoli, 2010)

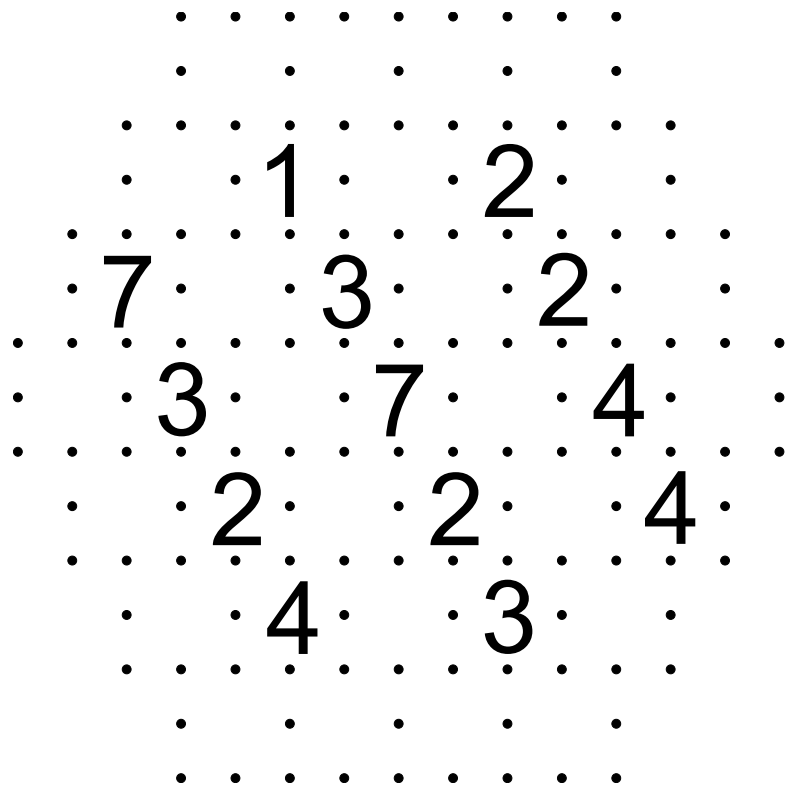


(#7 from Slitherlink & Masyu, Nikoli, 2010)



(#30 from Slitherlink & Masyu, Nikoli, 2010)

This variation follows the exact same rules as regular Slitherlink, but here the large numbers indicate how many of the *8* adjacent segments are part of the loop. The same general strategies apply, but you will need to figure out for yourself what constraints are imposed by the clues, since the patterns for regular Slitherlink do not apply.

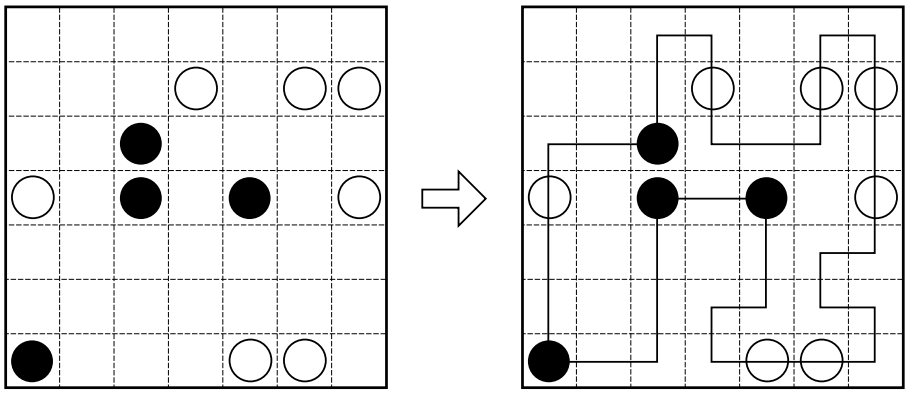



(#21 from US Puzzle Championship 2006)

## 3 Masyu

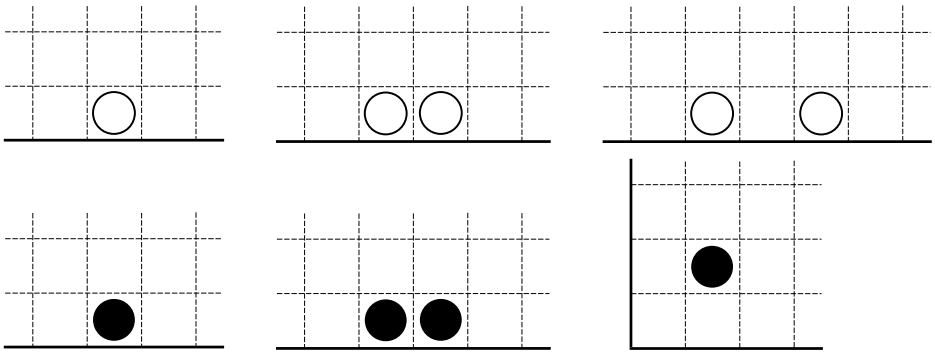
### 3.1 Introduction

The goal in Masyu is to draw a single closed loop composed of vertical and horizontal segments. These segments must go through the centers of the squares in the grid and must pass through all the circles. When the loop passes through a black circle, it must make a 90 degree turn and extend through 1 square in each direction. When the loop passes through a white circle, it must be straight, but make a 90 degree turn in the previous and/or next square on the loop.

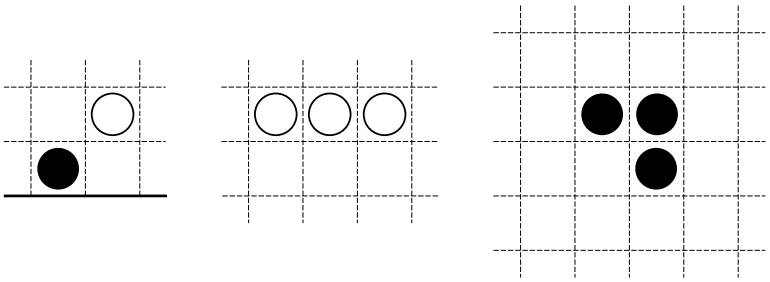


### 3.2 Tips/Strategies

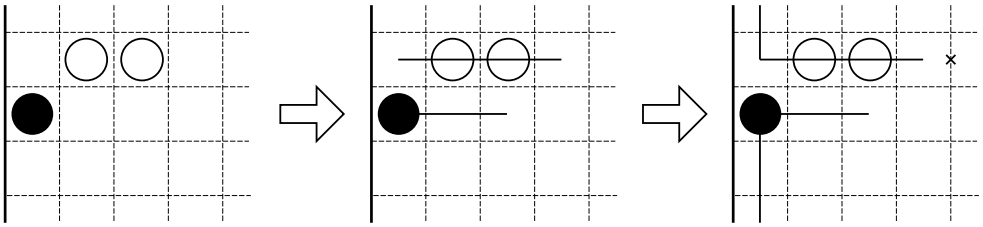
1. Mark obvious segments near the edges of the board.



2. Recognize patterns of adjacent (orthogonal or diagonal) clues.

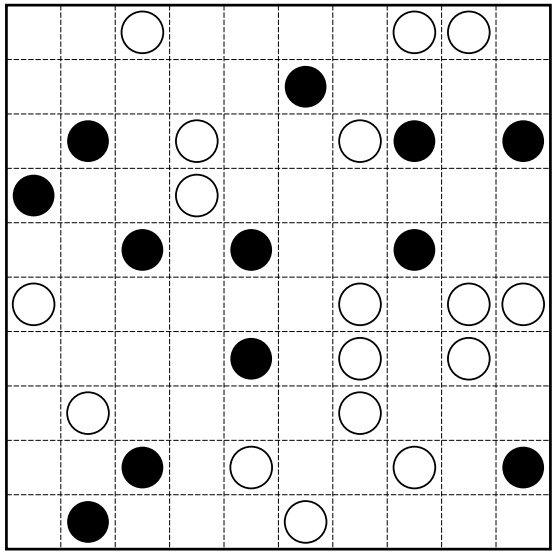


3. Mark impossible crossings.

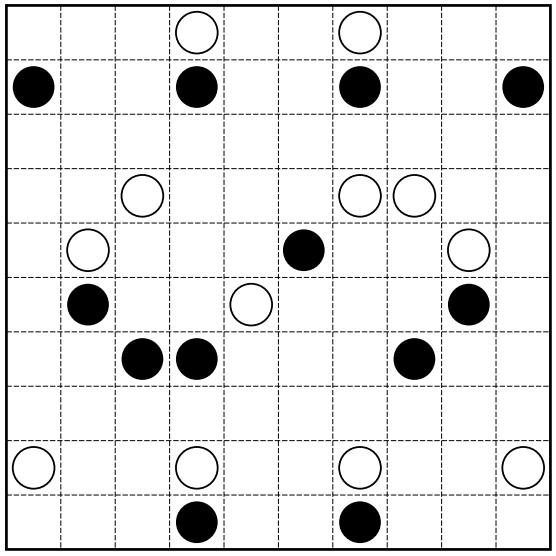


4. Don't close loops (until the end).

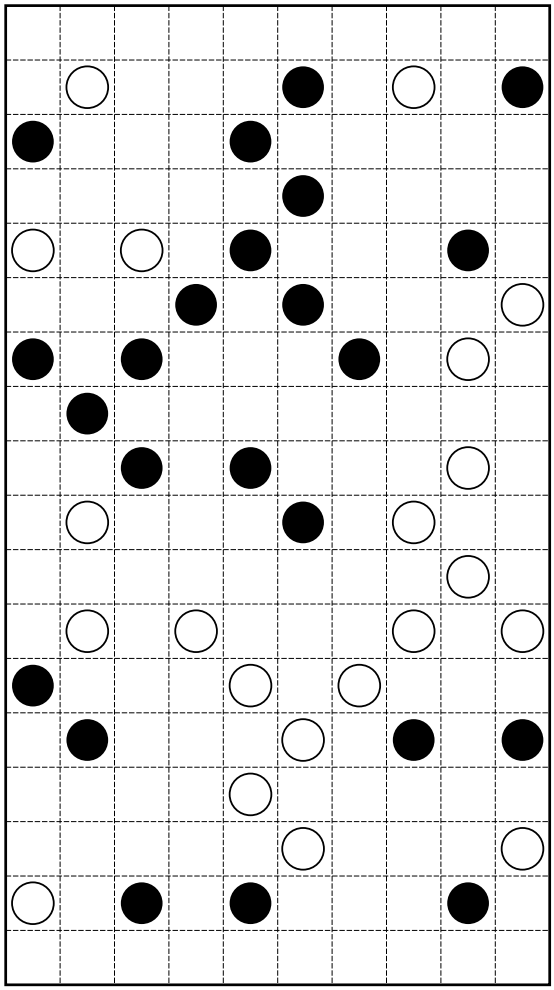
### 3.3 Exercises



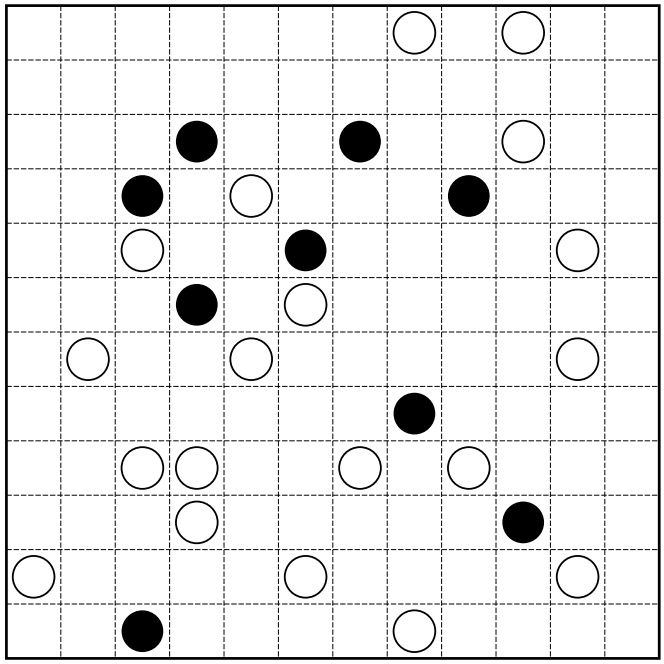
(#73 from Slitherlink & Masyu, Nikoli, 2010)



(#88 from Slitherlink & Masyu, Nikoli, 2010)



(#103 from Slitherlink & Masyu, Nikoli, 2010)



(#12 from US Puzzle Championship 2007)

## 4 Advanced Tips

1. Crossing the loop means that one moves between the interior and exterior regions. Sometimes this can be used to help visualize where the loop should be, since all exterior regions must eventually reach the outside border.
2. Any region of the problem must be crossed by the loop an even number of times. By defining regions carefully (along the edges or borders), one can sometimes determine which edges can exist.
3. Each puzzle has a unique solution. If drawing the loop a certain way allows for multiple possible solutions (because that are of the puzzle is now isolated, then that cannot be correct.

## 5 References

See also:

1. `http://wpc.puzzles.com/` (US Puzzle Championship)
2. `http://www.nikoli.co.jp/en/` (Nikoli, Japanese Puzzle Magazine)
3. `http://http://logicmastersindia.com/` (Logic Masters India)
4. `http://motris.livejournal.com` (Blog of Thomas Snyder, USPC Winner 2006-2010)
5. `http://mellowmelon.wordpress.com/` (Blog of Palmer Mebane, USPC Winner 2011)