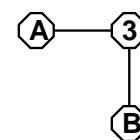


Bridges a.k.a. Hashiwokakero

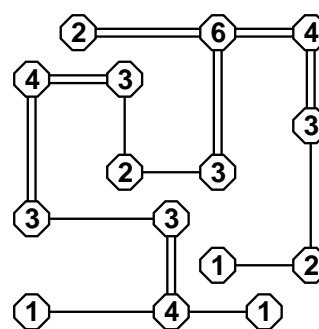
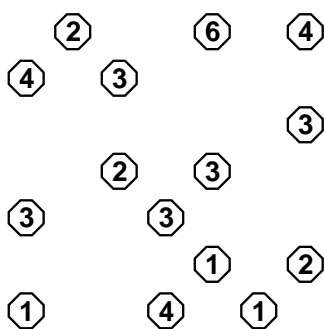
I remember seeing this puzzle being released for public consumption in the odd festive season about two decades ago, but it has never been adopted regularly in any newspaper I frequent. Some publications have increased their puzzle content since the pandemic, but I have only seen either ‘more of the same’ or a few extras designed for a short attention span. (I do not refer to the **Sandwich Sudoku** which appeared in the Guardian before the lurgi. This is a fine variant with similarities to Killer Sudoku, and I was wondering whether it was worthwhile to make some. They are very easy to make, and then testing for uniqueness is worthy of any serious puzzler. Maybe we should have user interaction with this puzzle – but now back to the Bridges.)

When I was preparing my book, and deciding to use my first name in latinised form, Godefridus, as pseudonym, I thought that Bridges had to be in there. I made enough for the book in a fortnight, but a serious effort has now been needed to make enough with relative ease. It is easy to draw by hand a figure representing a number of islands, here drawn as little octagons, joined up by bridges spanning across or down the page between them, such that all the islands are connected, looping circuits being allowed. This figure can then be made into a puzzle by making the bridges either single or double spans, placing the number of spans from each island inside the little octagon and removing the bridges from the diagram. Your solving task is then to determine all the spans. Let’s get going with just one solving tip, leaving you to discover a number more.

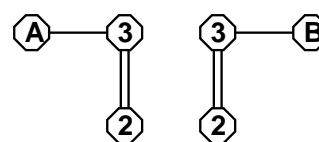
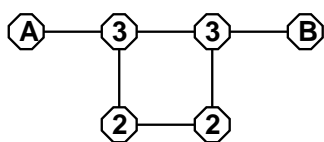
Imagine that the puzzle has a 3-span island in the top right corner, and can have spans to islands A and B. Three spans are not allowed, so there must be **at least** one span to each as shown. You need to determine which is the double span.



Here’s a simple puzzle plus solution.



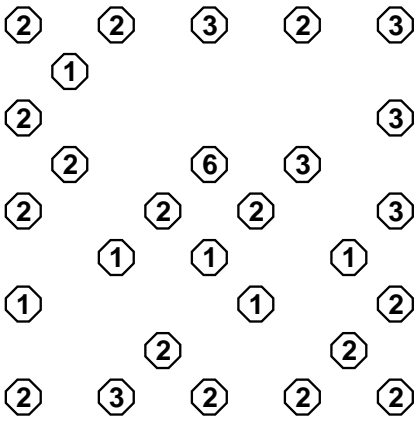
The solution to a bridges puzzle must have all the islands connected, but with the bigger puzzles it becomes very hard to work out the connectivity, even to the point of sheer frustration. The very tricky puzzles that need the investigation of connectivity have been avoided here, but if you find them elsewhere you will encounter a situation like the following. Islands A and B are connected to the bulk of the solution but you don’t know whether there is connectivity between A and B.



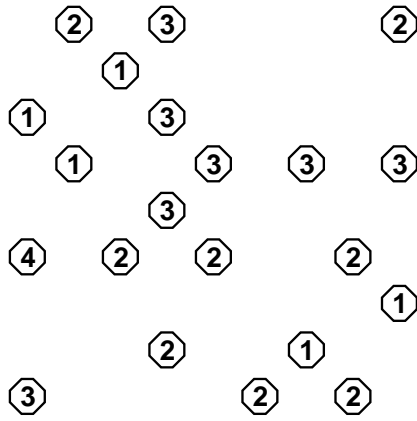
If A and B are not connected through the bulk of the solution, the bridge span arrangement on the left must be invoked, otherwise the solution is invalid. If on the other hand there is connection between A and B it does not matter which arrangement is chosen as both obey the rules, except the rule that there should be just one solution. Situations like this often occur in logic puzzles, and some puzzlers will use the uniqueness rule to make a choice, on the grounds that the alternative choice will give two solutions. Although this is fair game I avoid making such decisions, but this is primarily because this is a decision that I am not allowed to make when constructing a puzzle. Indeed one of the most difficult construction problems is in ascertaining that the new problem has a unique solution; when I have made mistakes in the past they have always been due to this issue.

In the problems which follow I am assuming that newcomers will quickly graduate to the larger puzzles, which are more difficult as size matters. The bigger ones themselves get harder after the first dozen, at a point where I remembered how to grade them. Happy exploration!

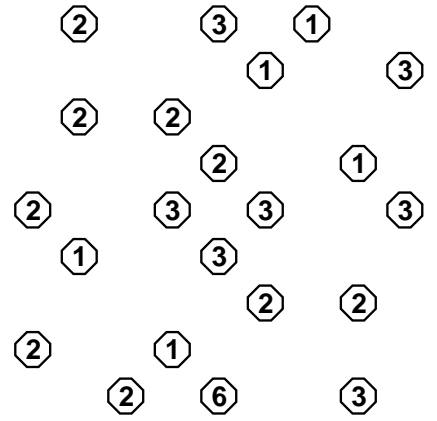
Bridges 9×9



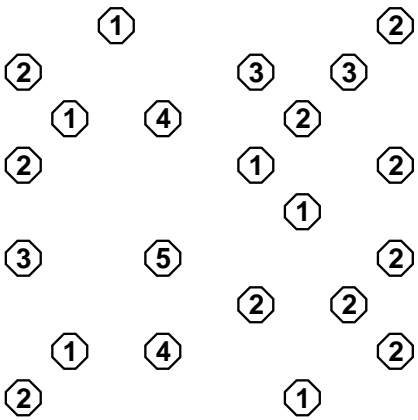
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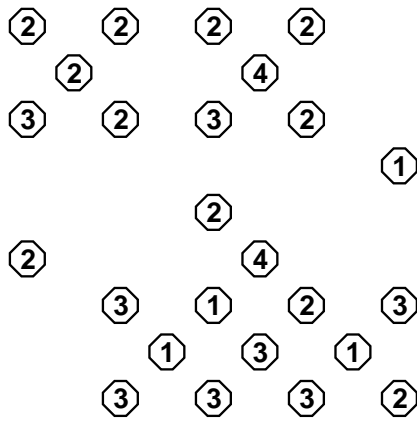
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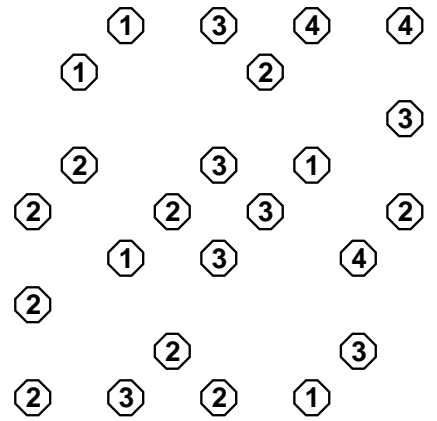
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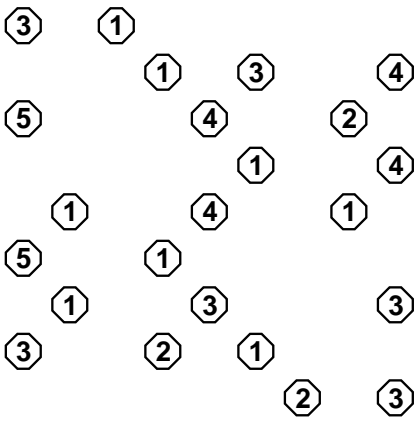
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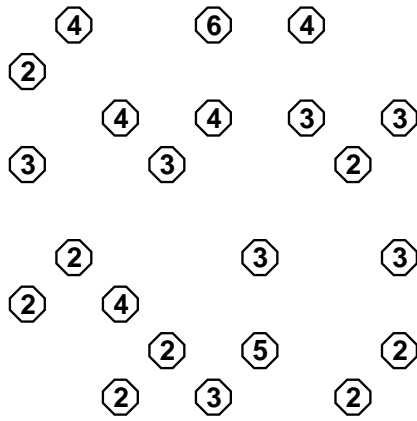
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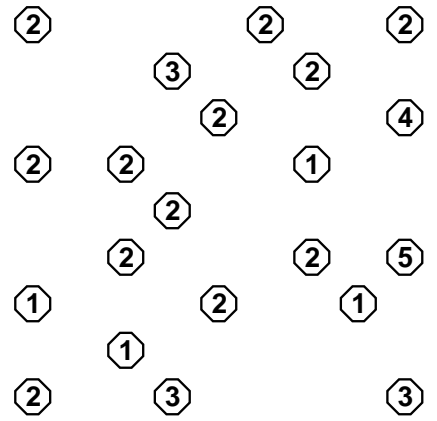
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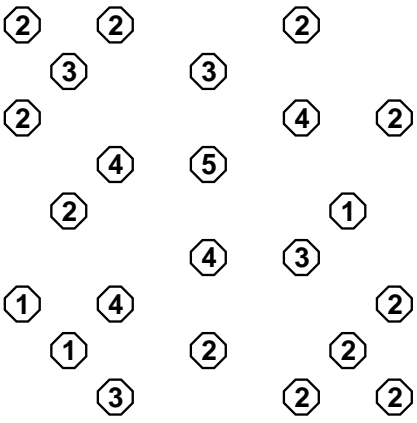


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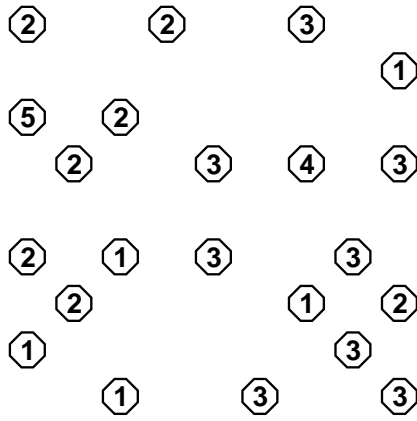


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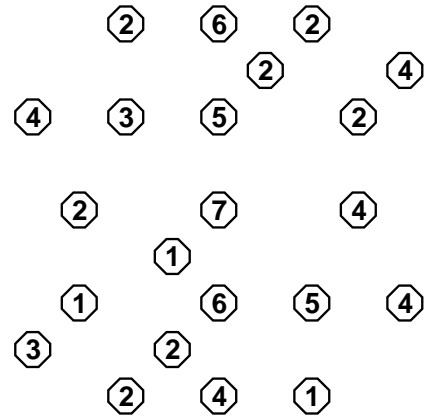
Bridges 9×9



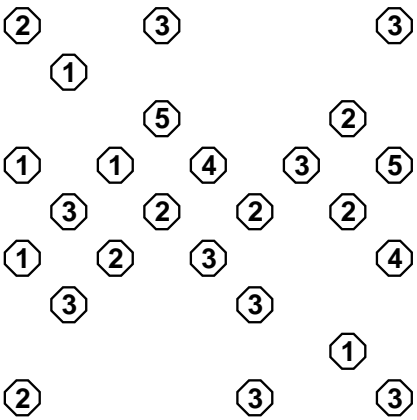
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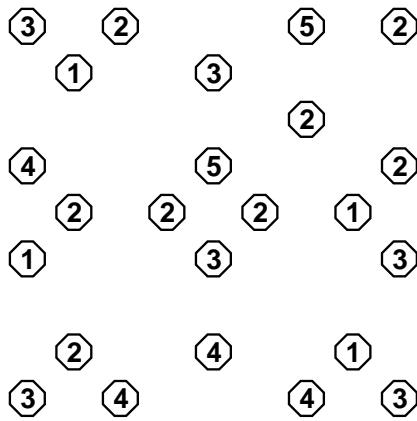
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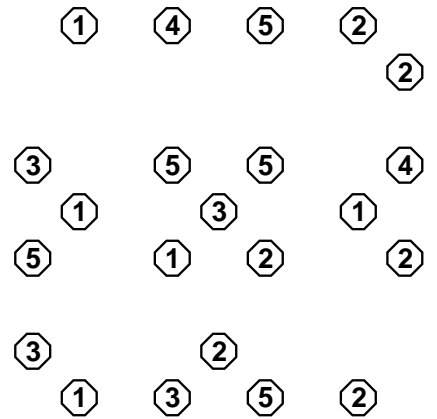
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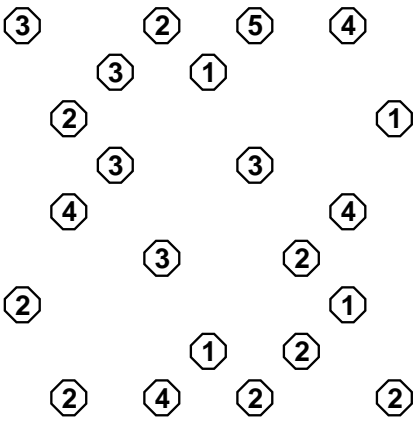
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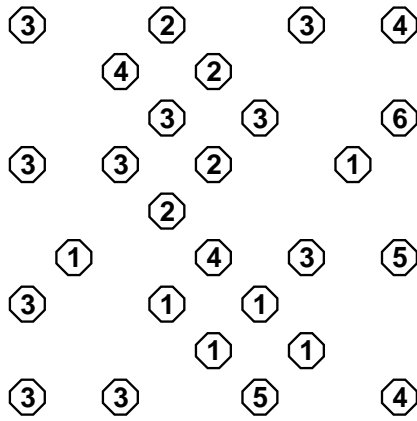
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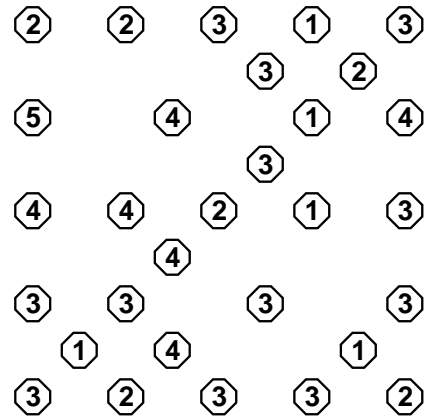
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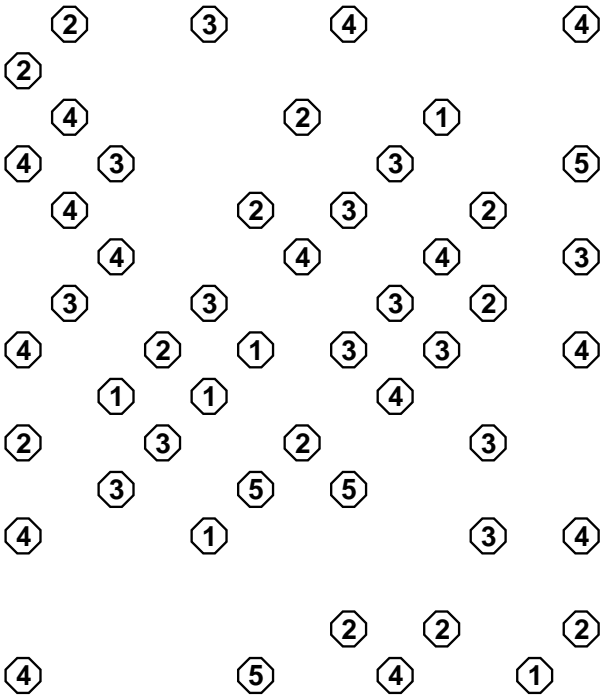


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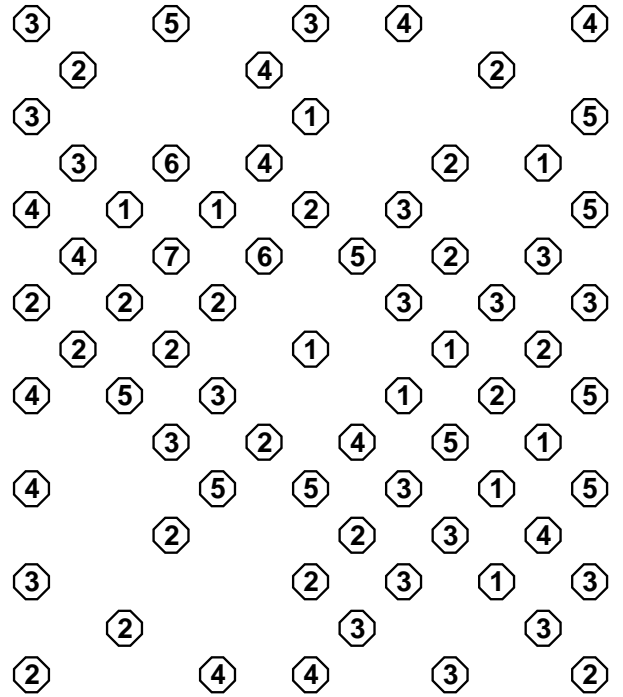


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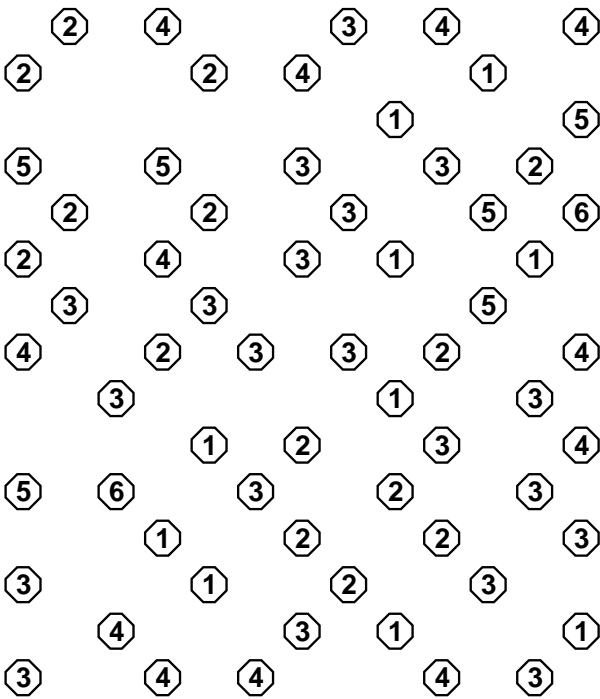
Bridges 13×15



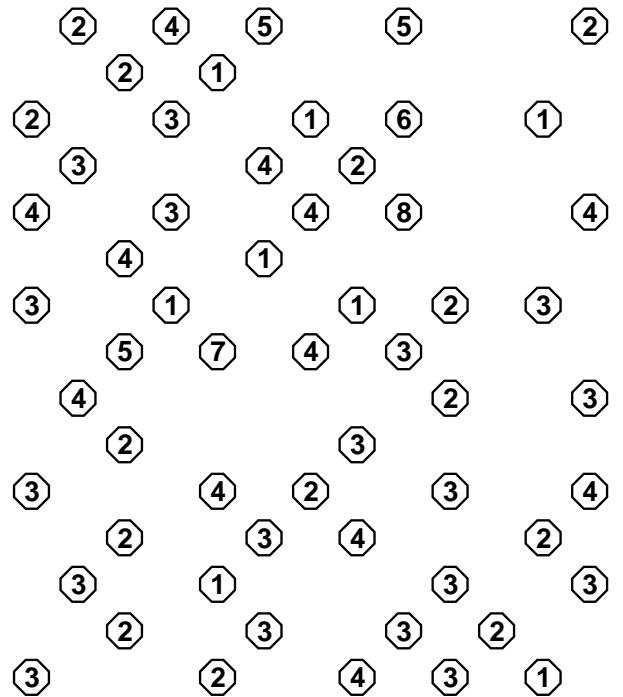
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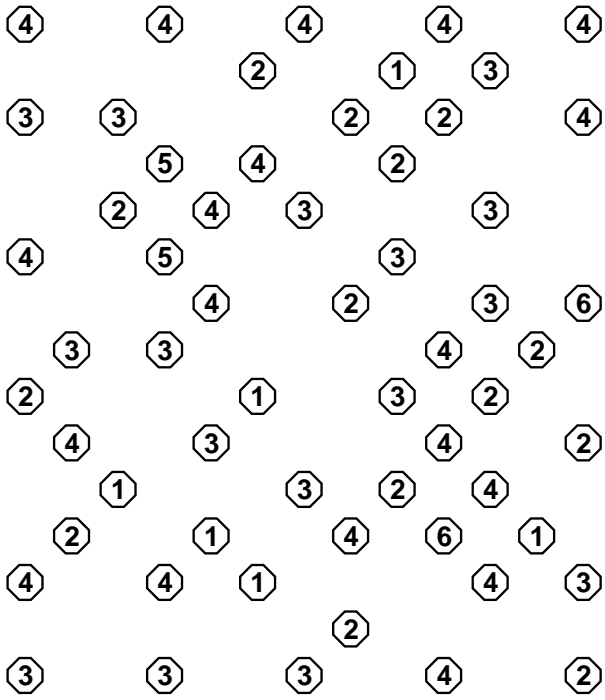


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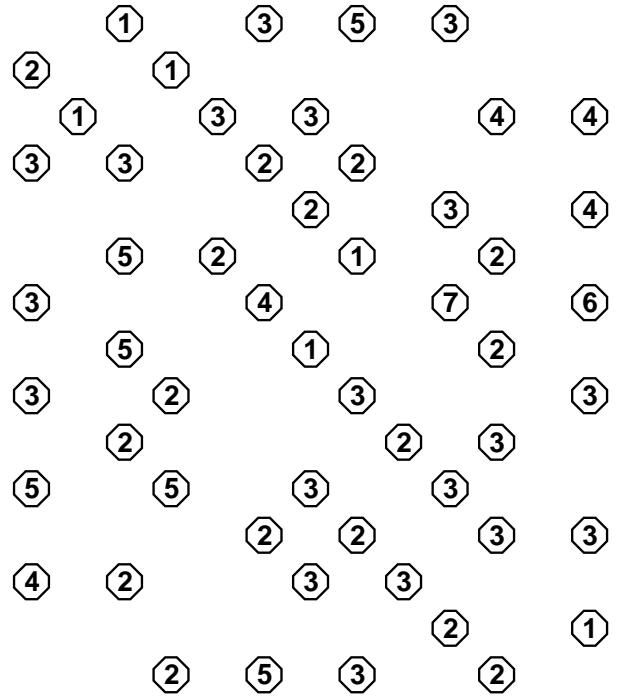


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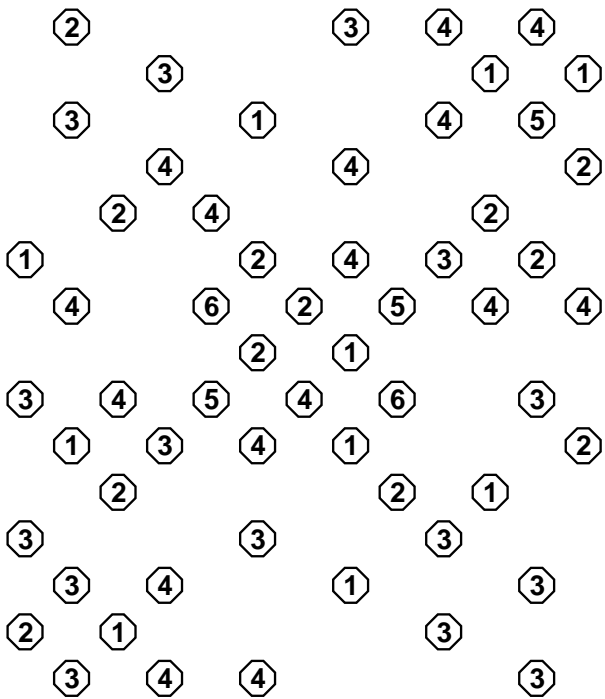
Bridges 13×15



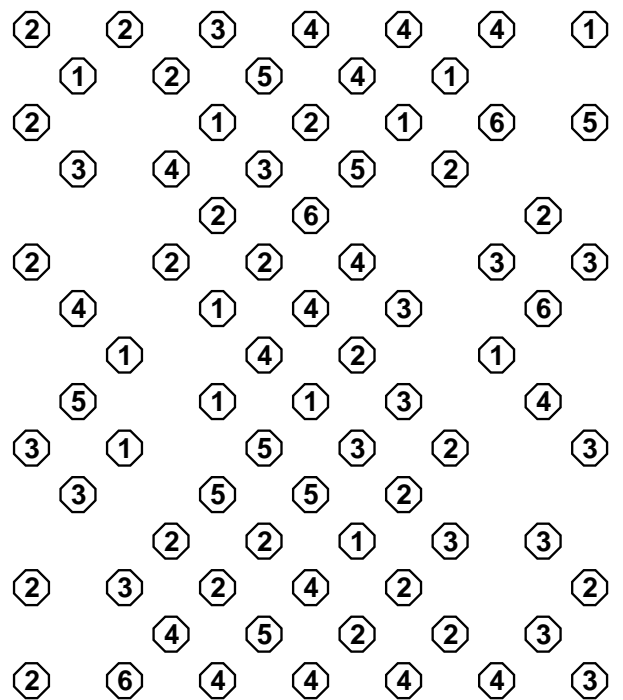
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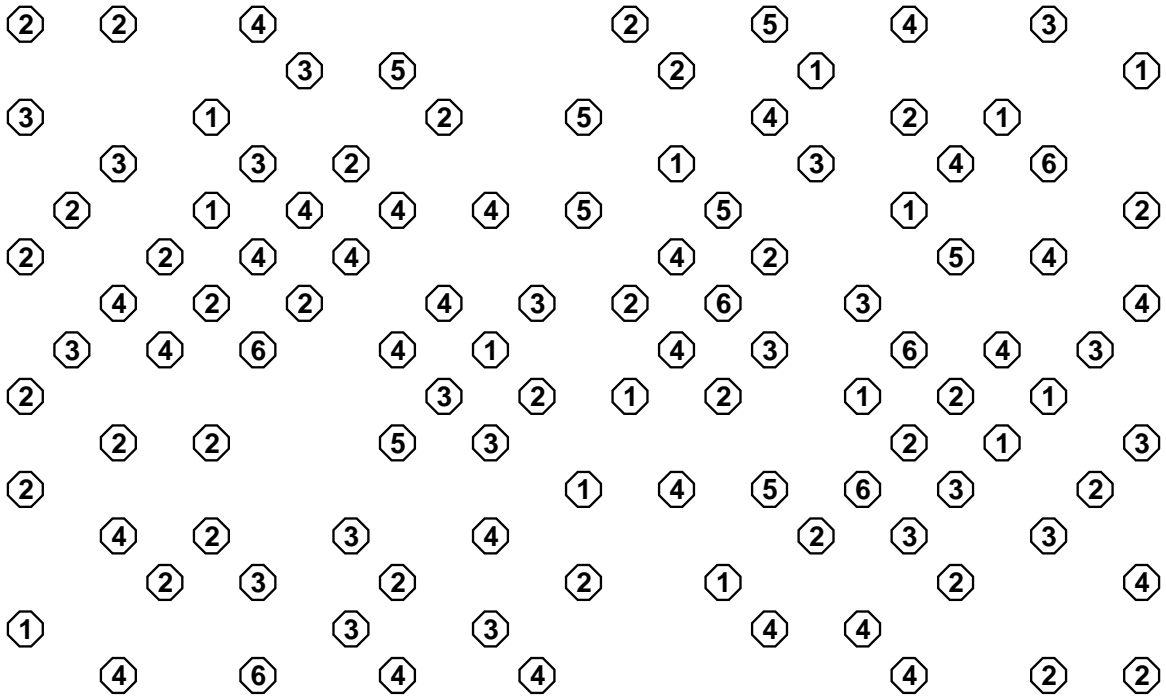


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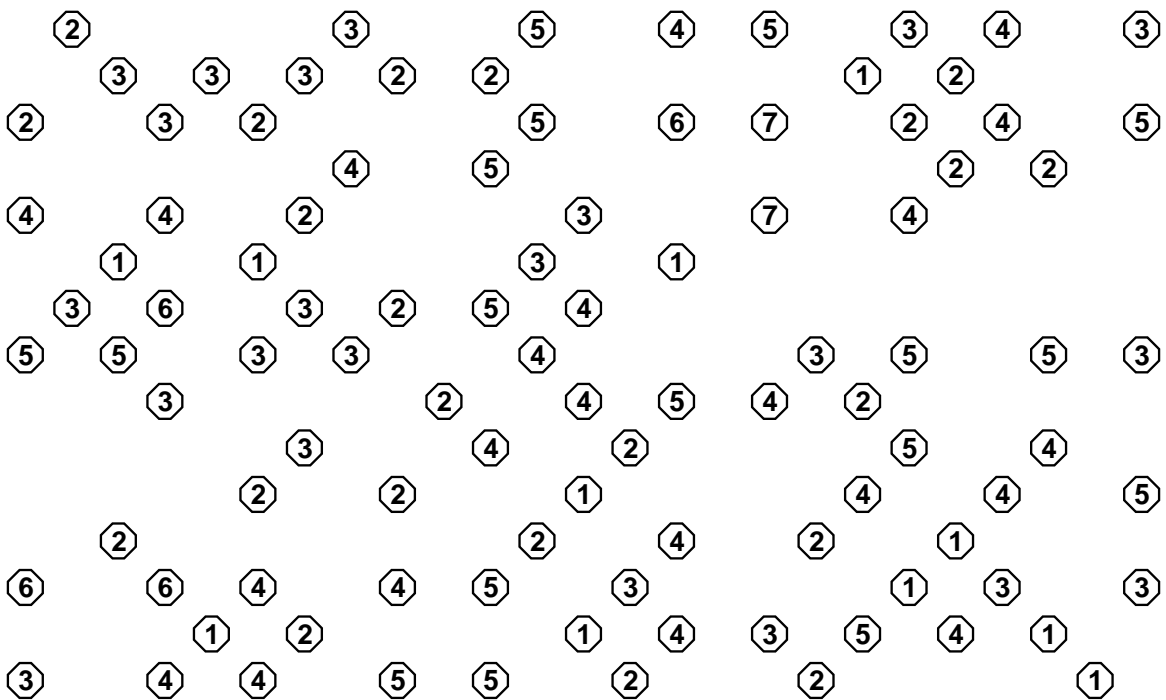
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Bridges 25×15

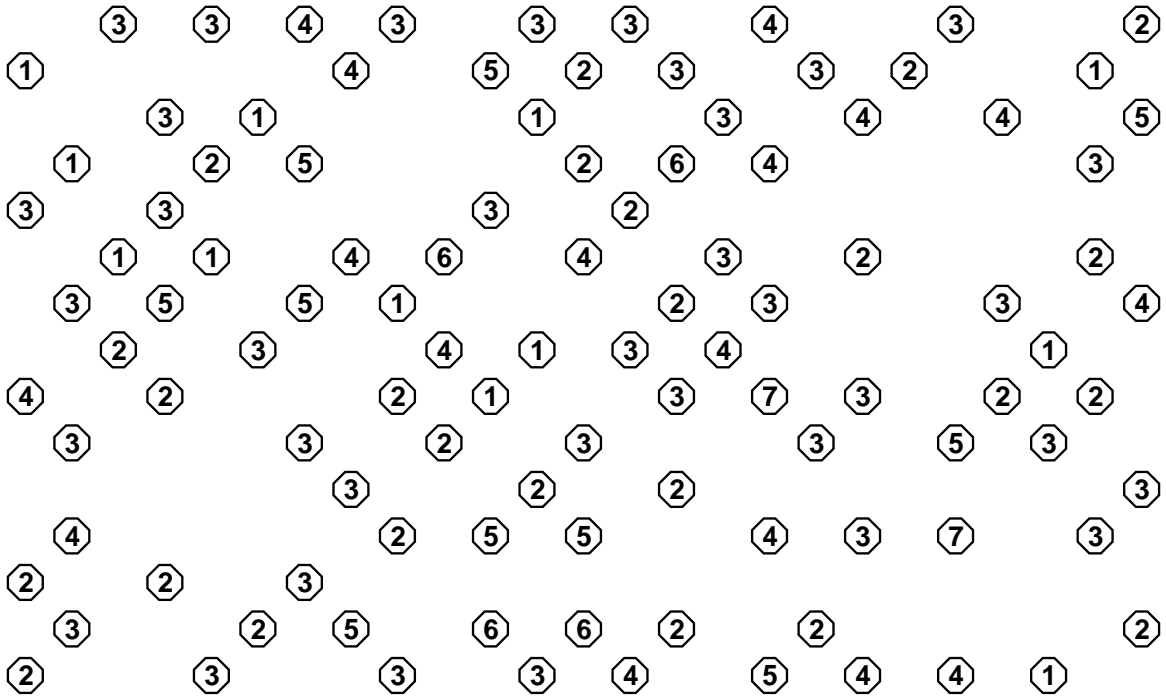


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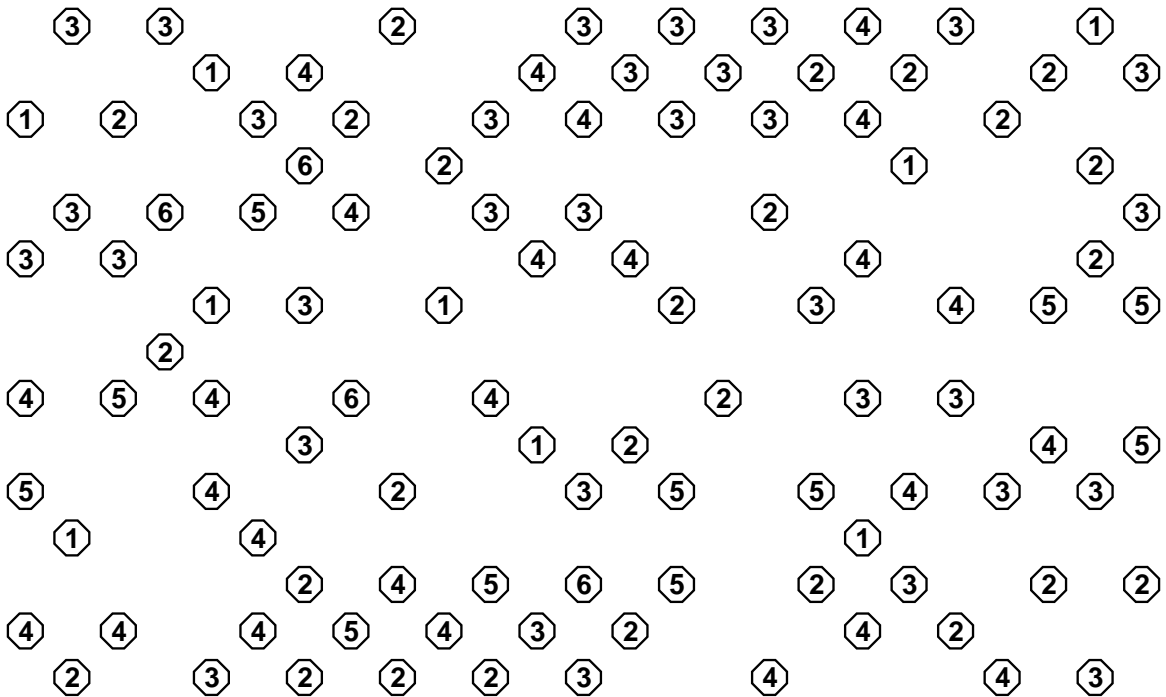


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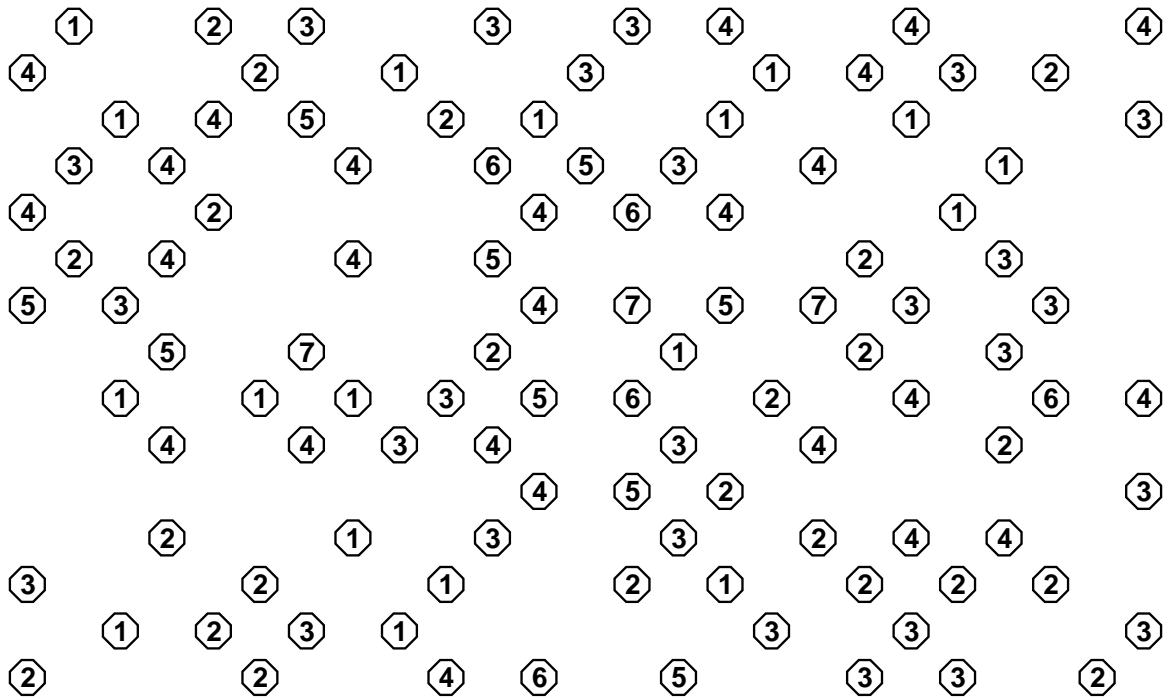


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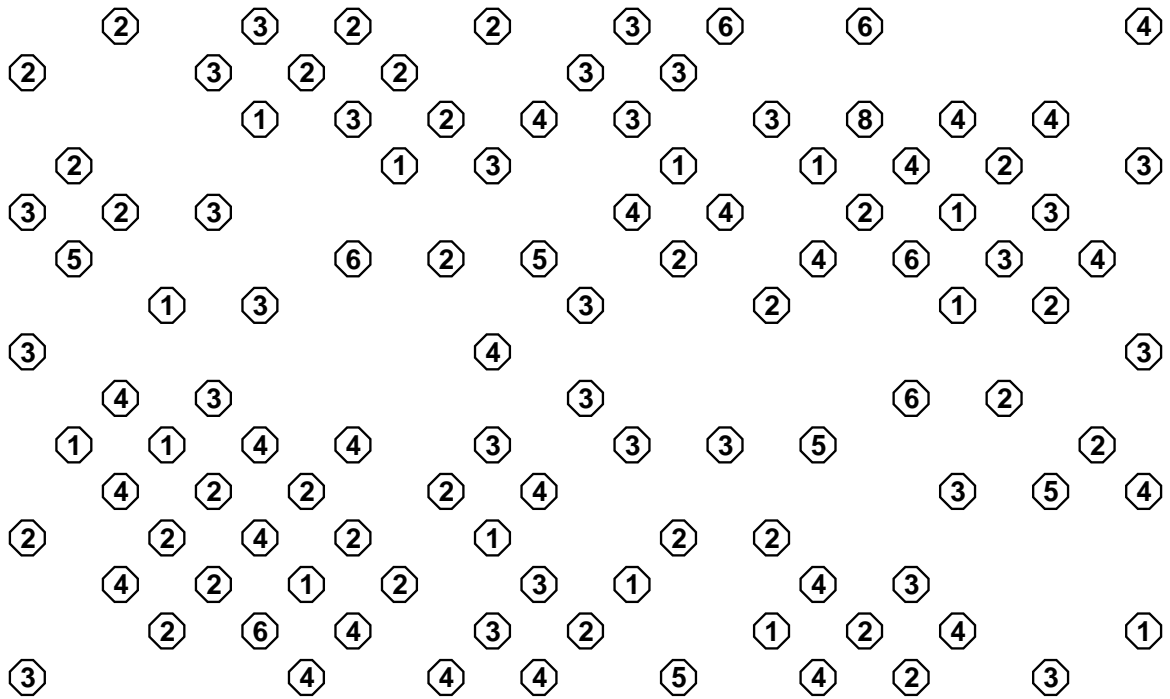


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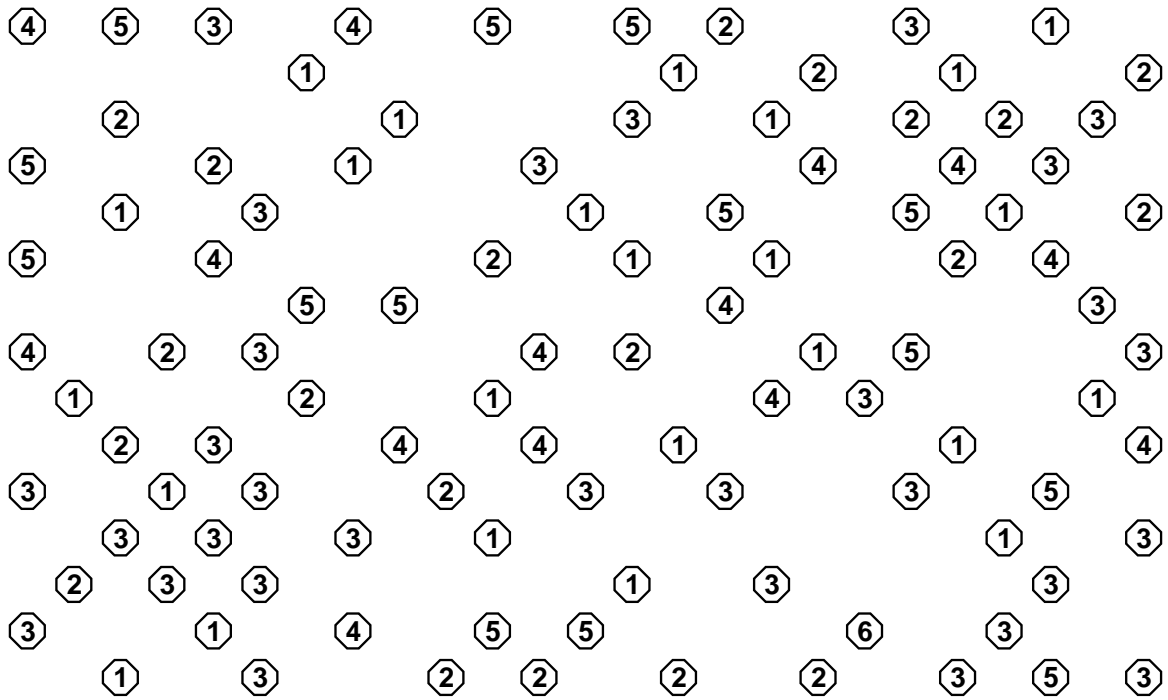


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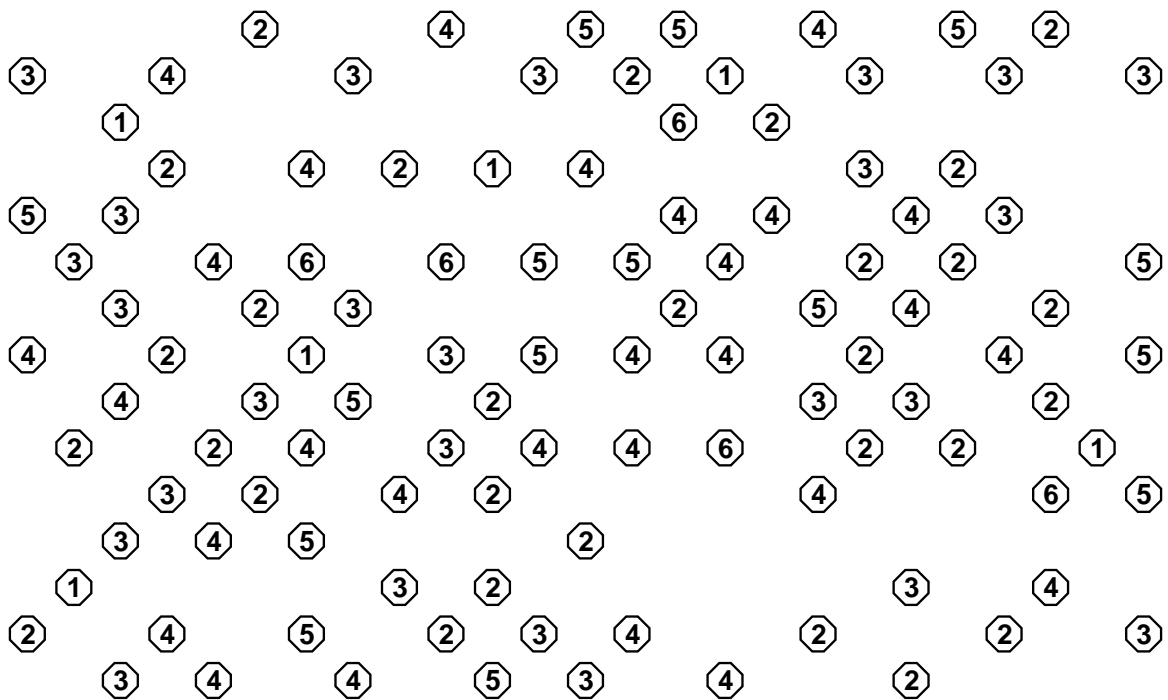


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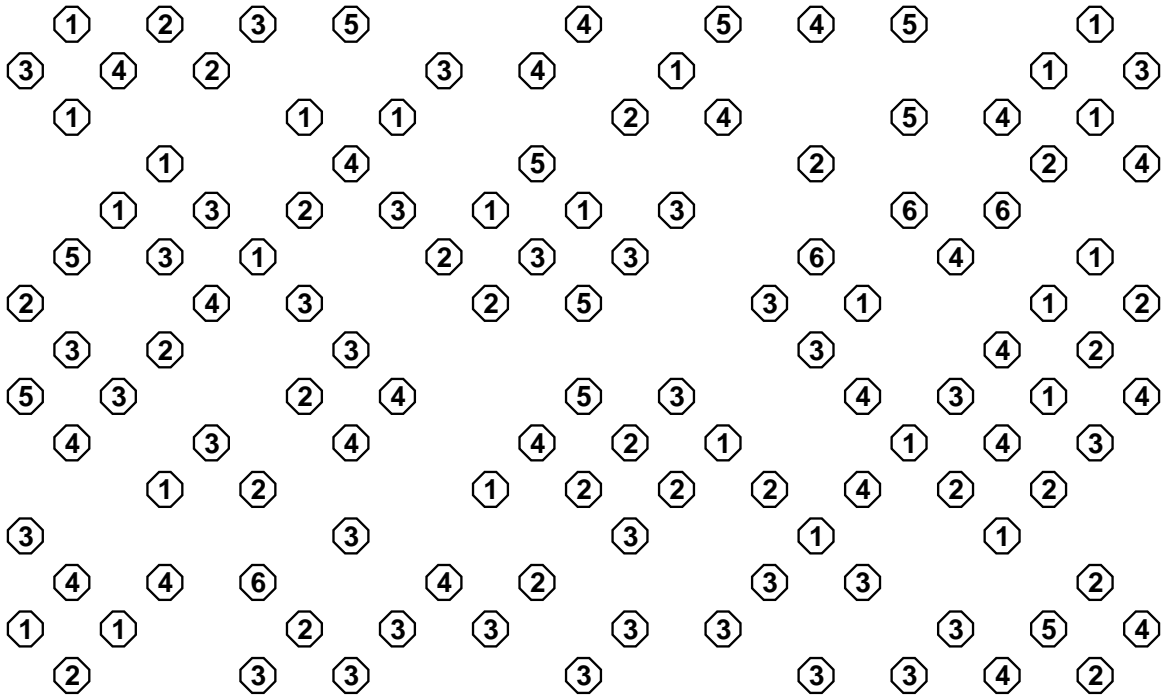


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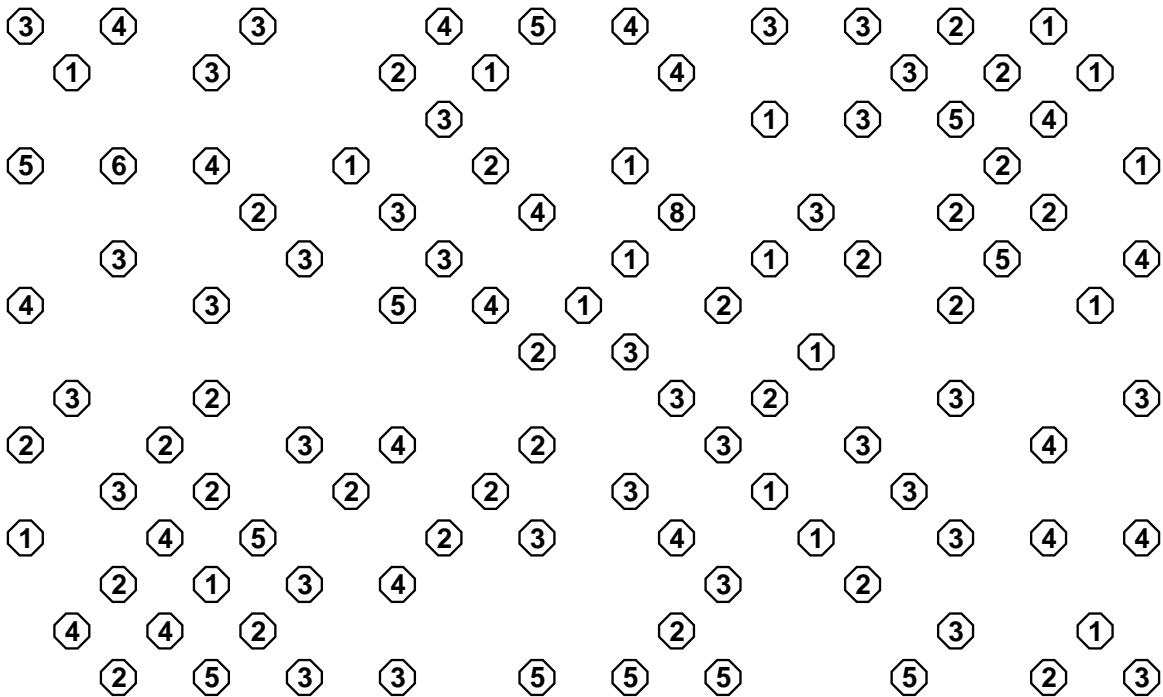


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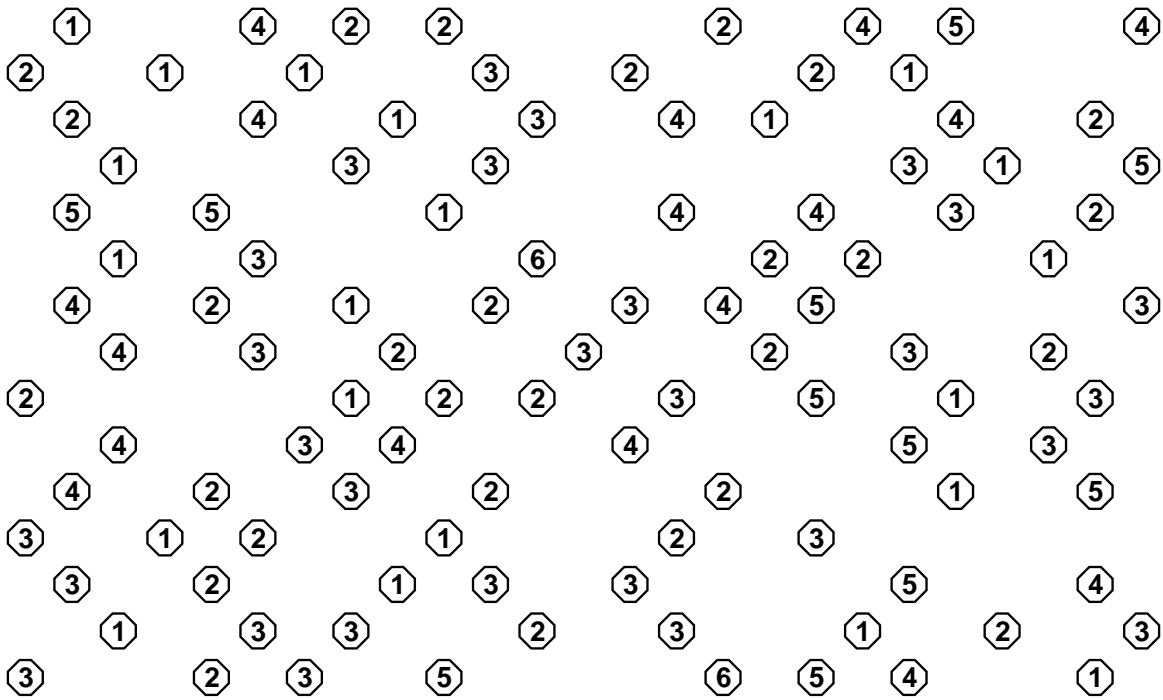


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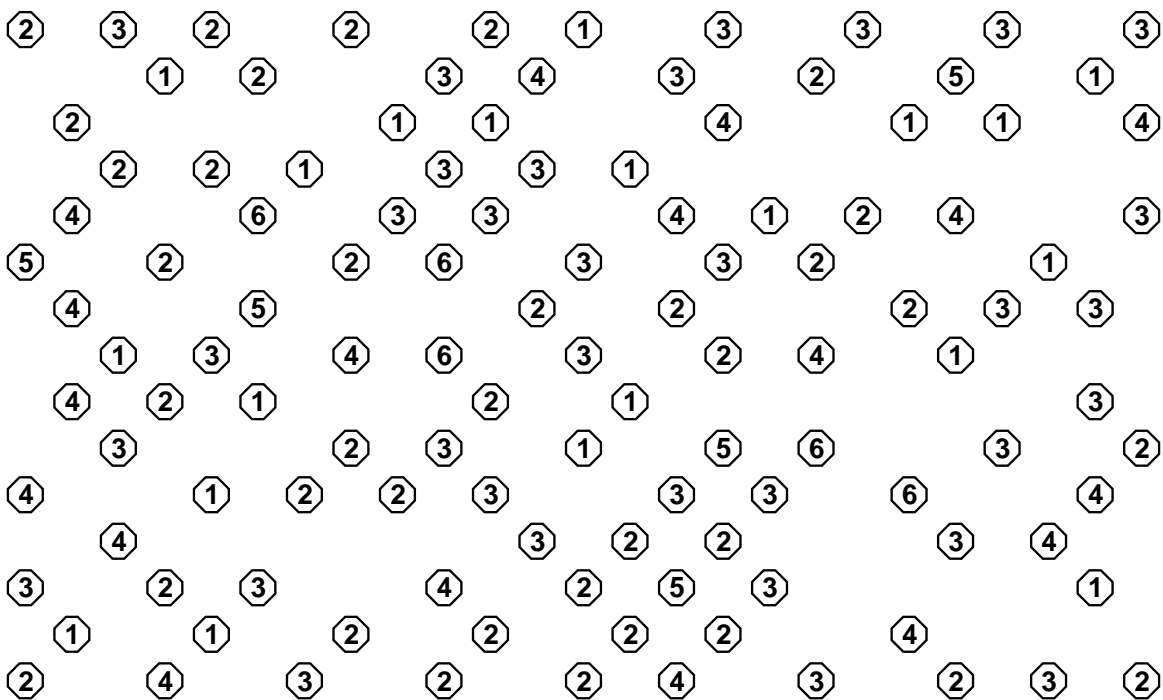


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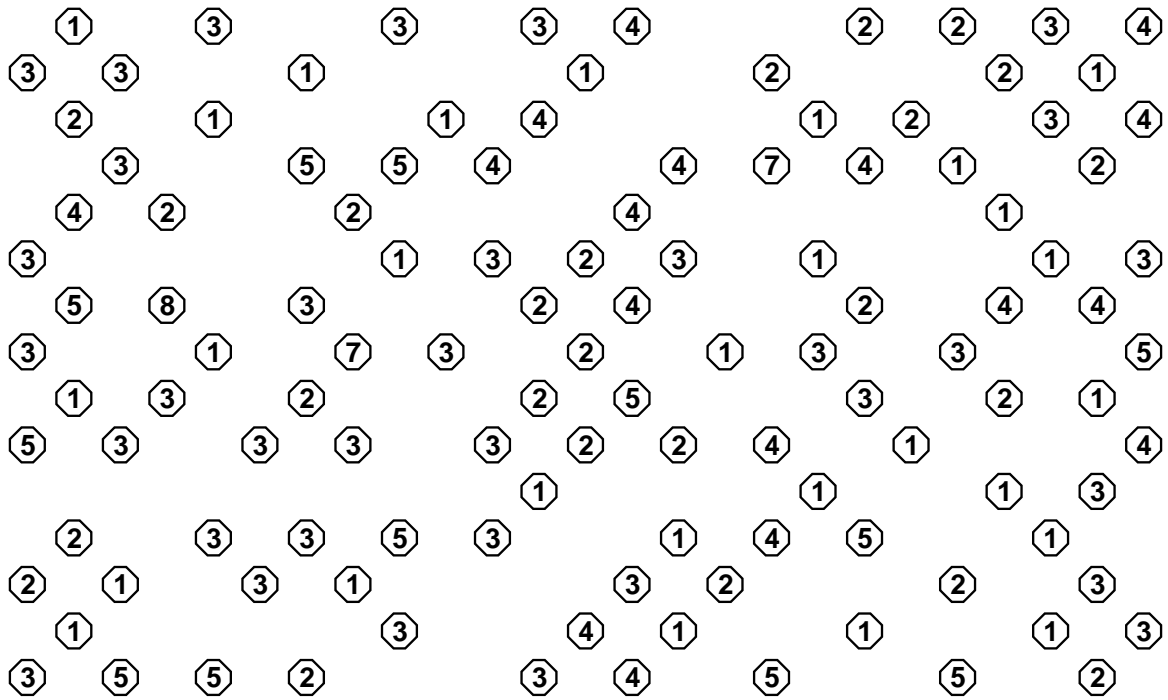


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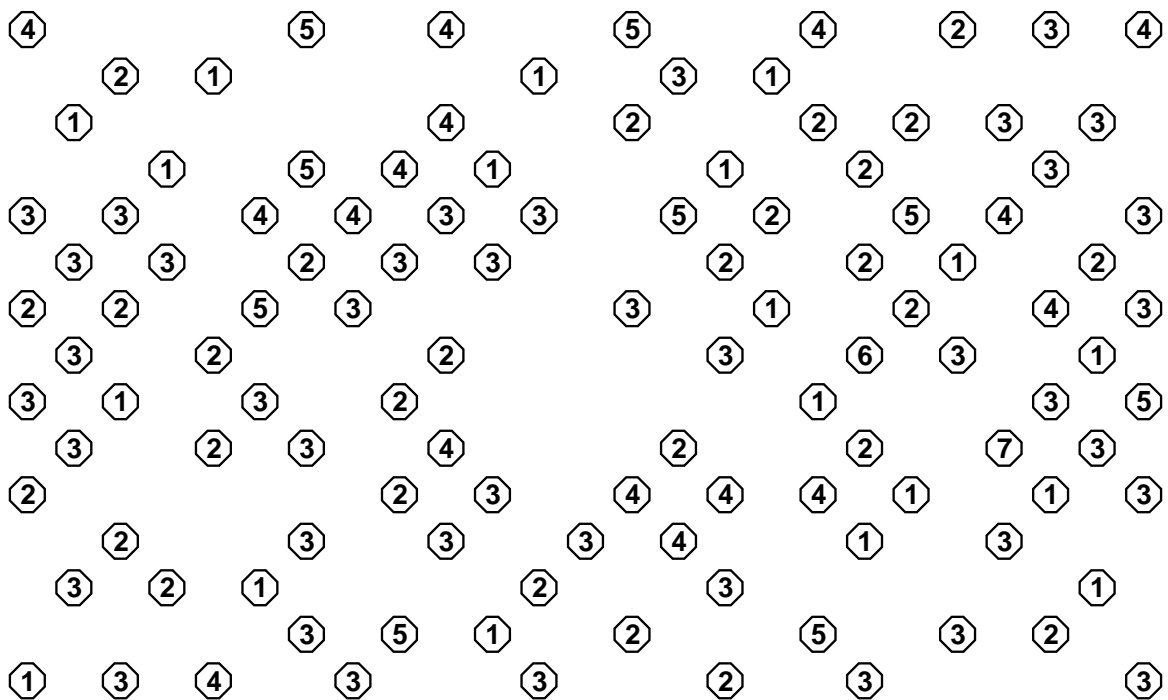


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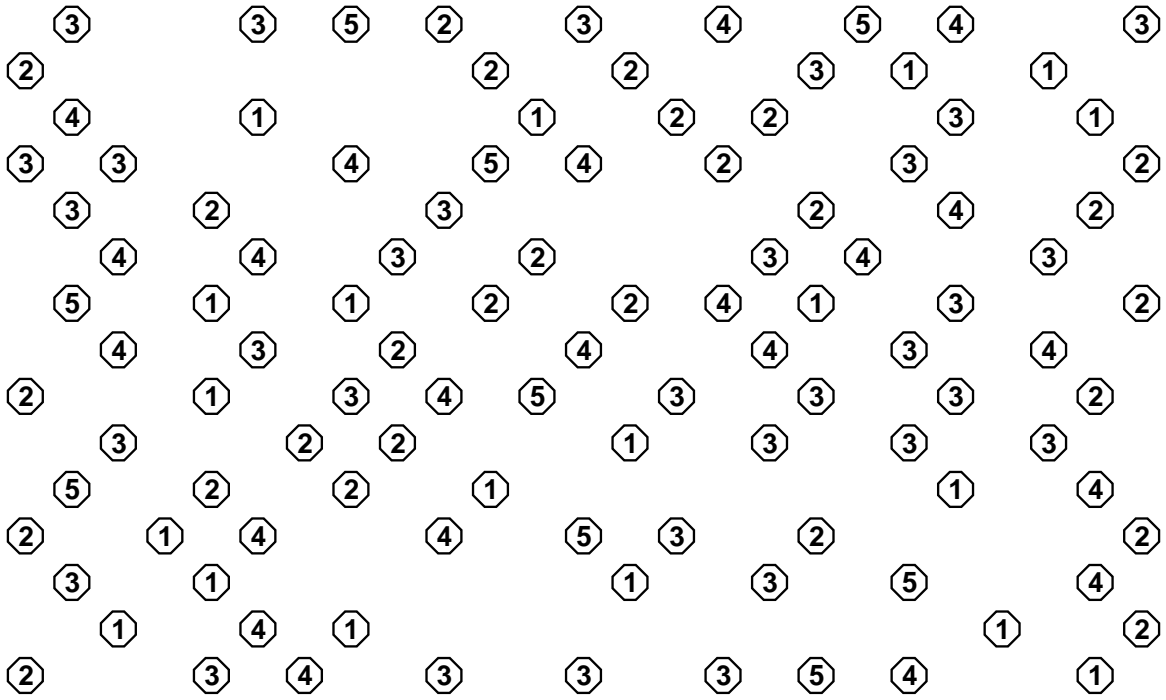


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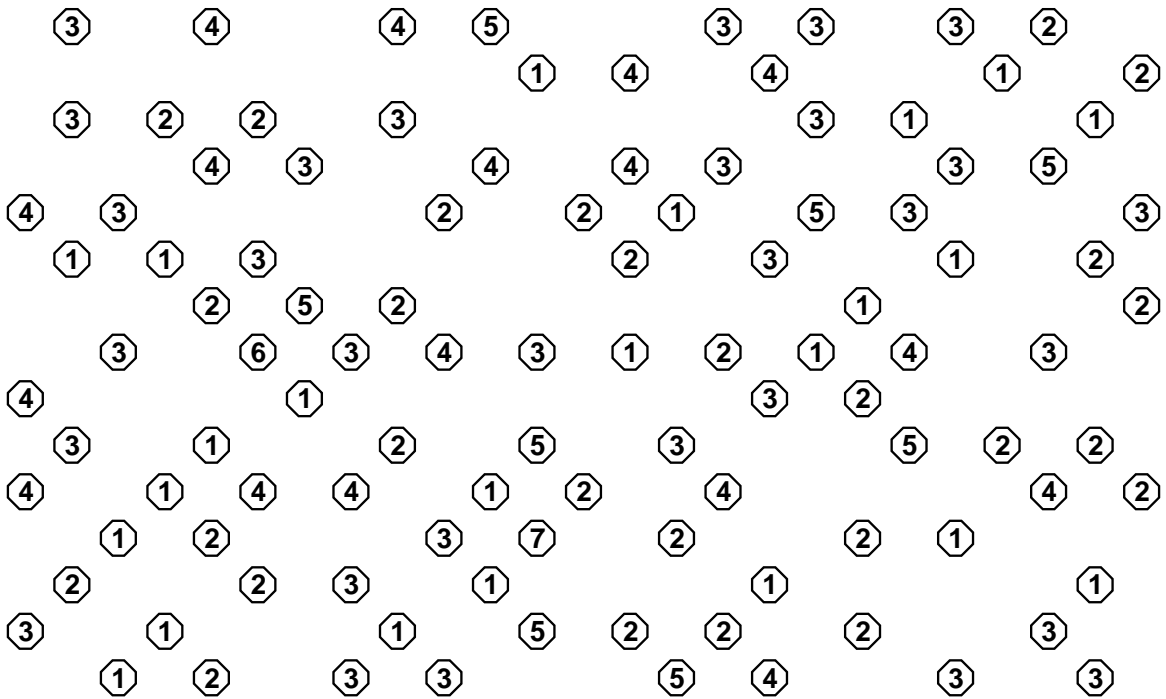


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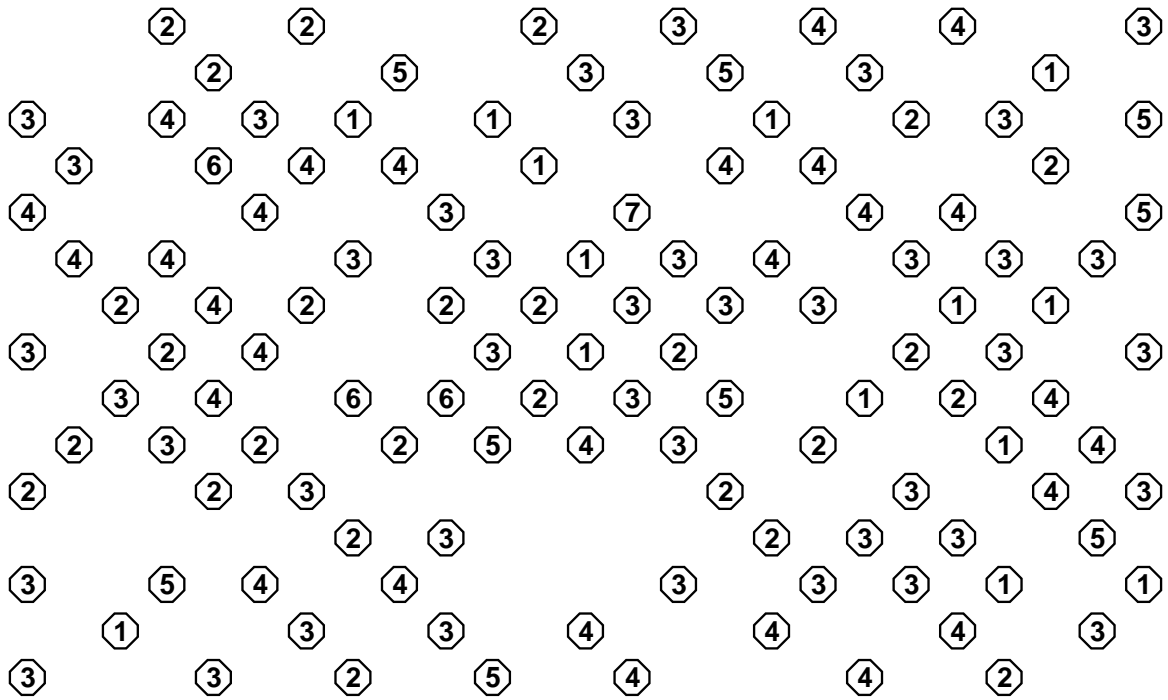


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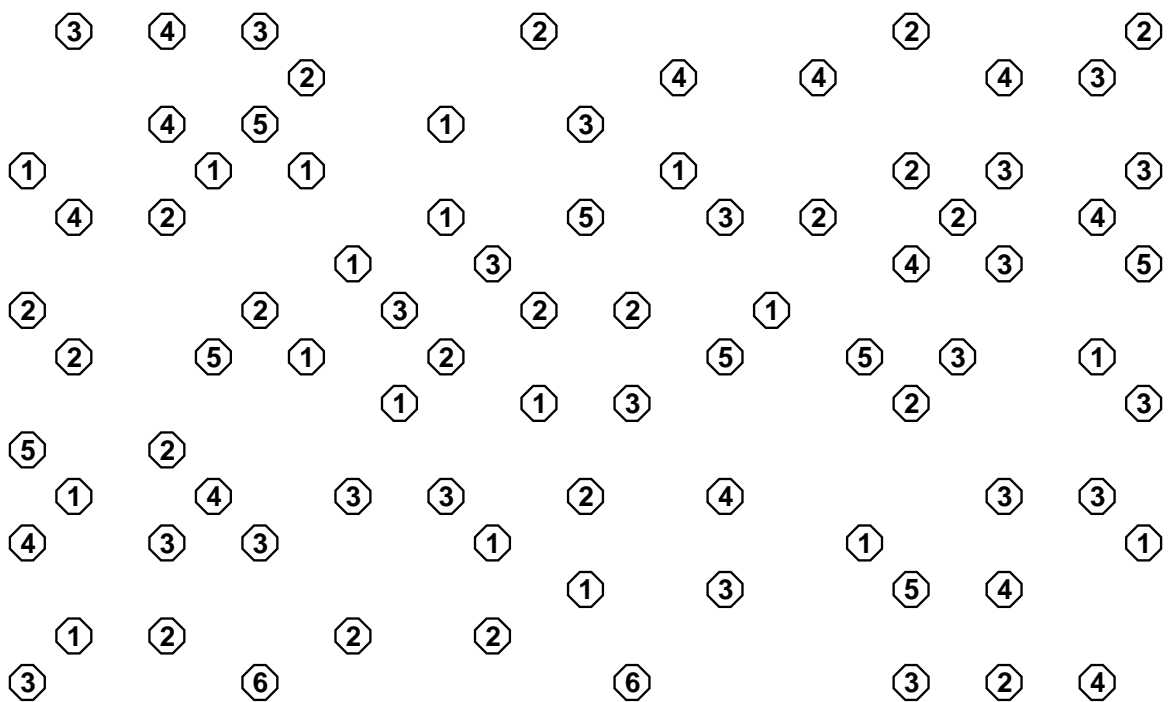


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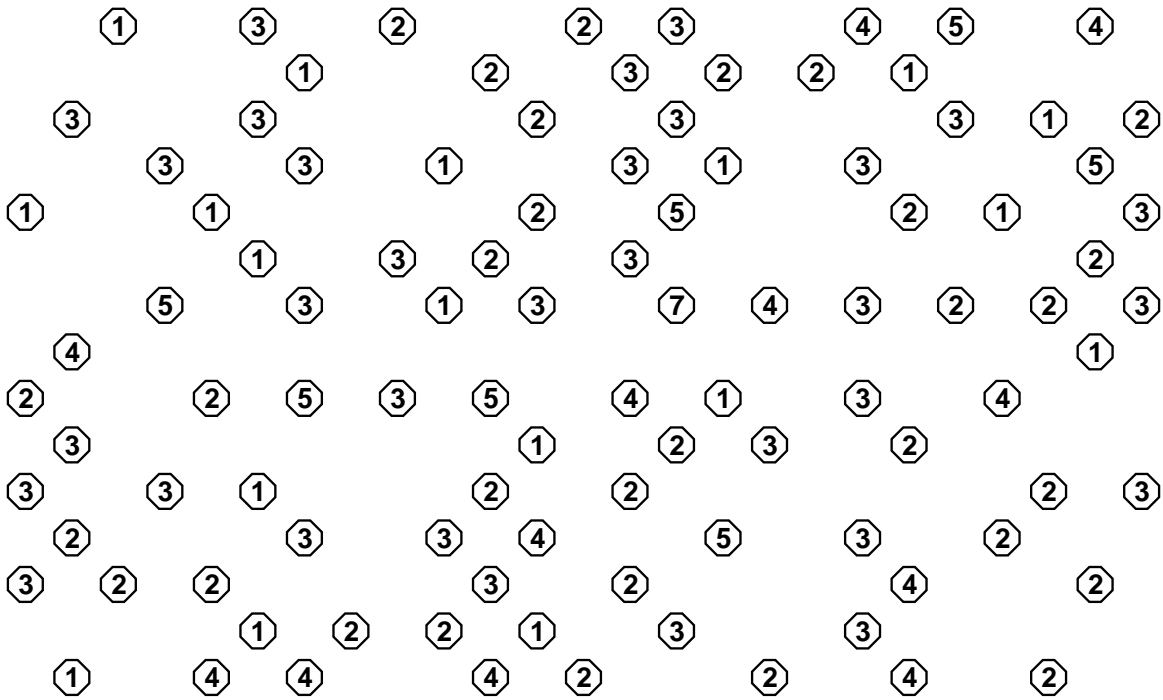


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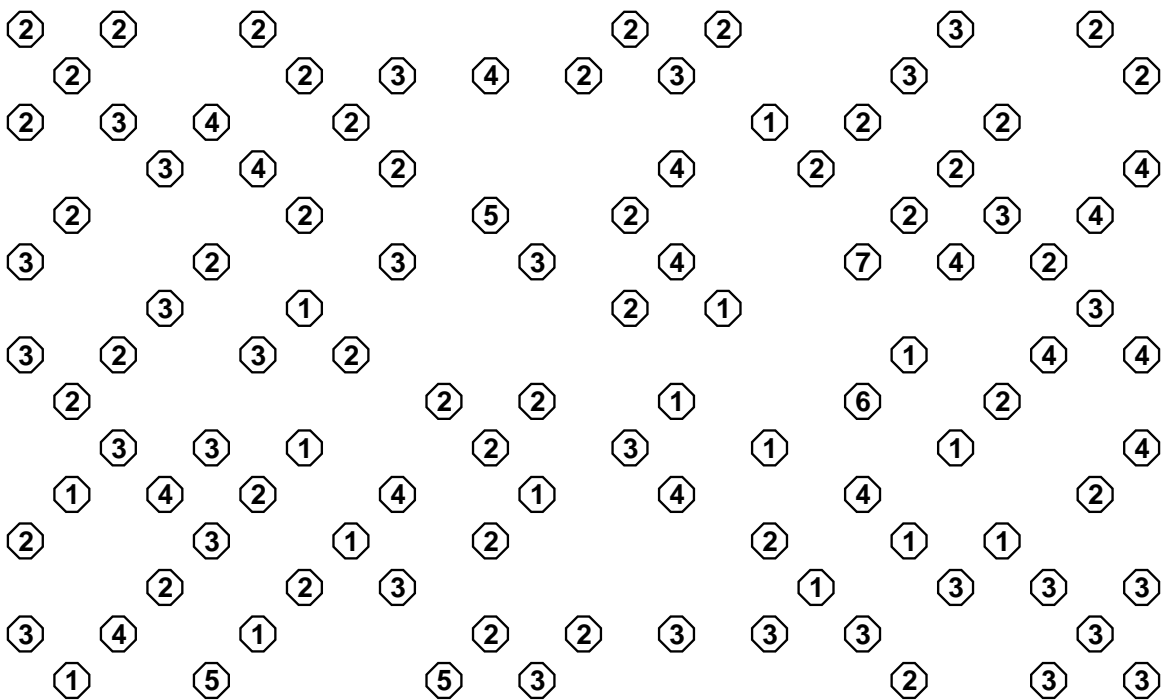


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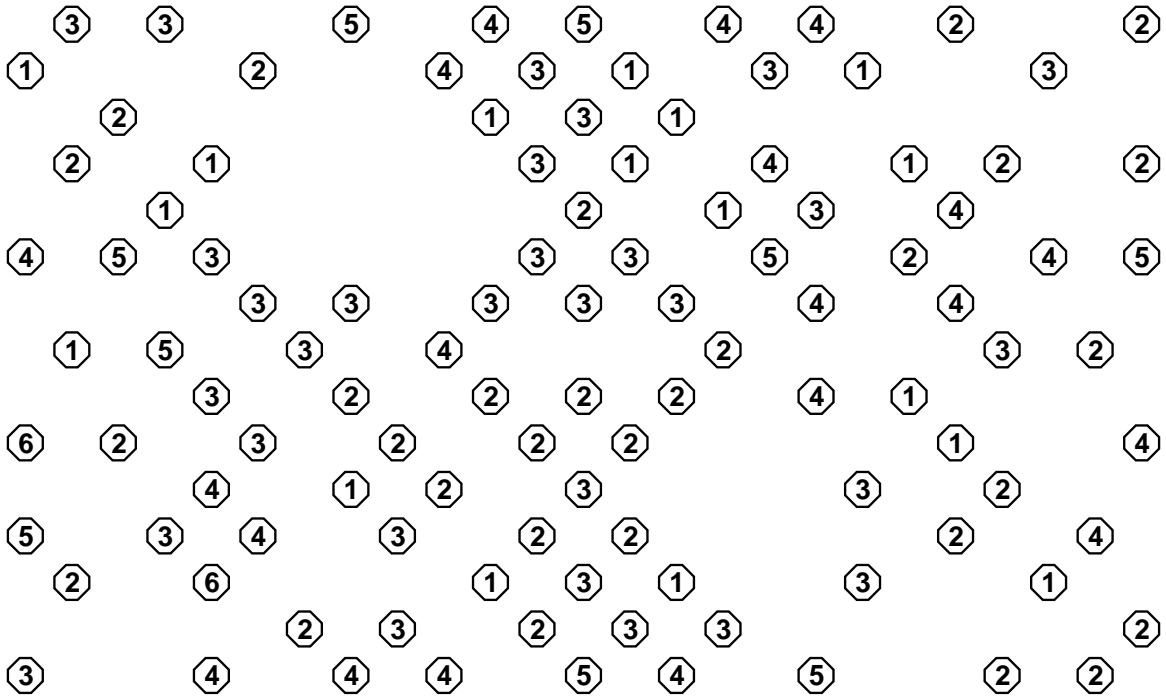


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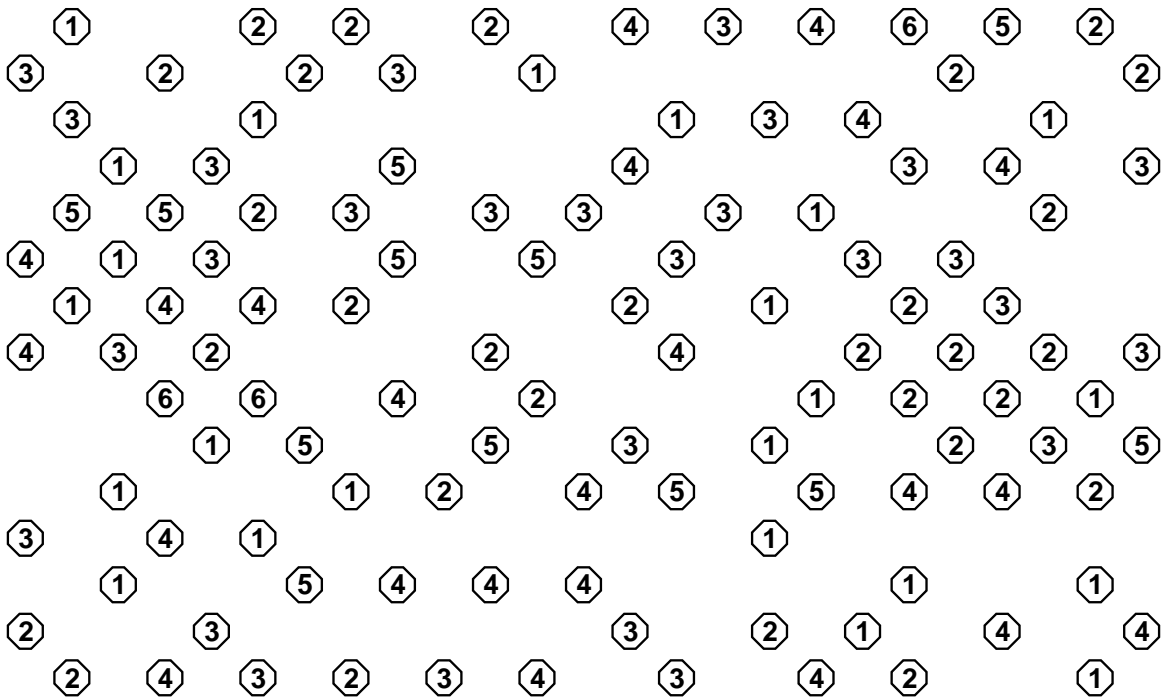


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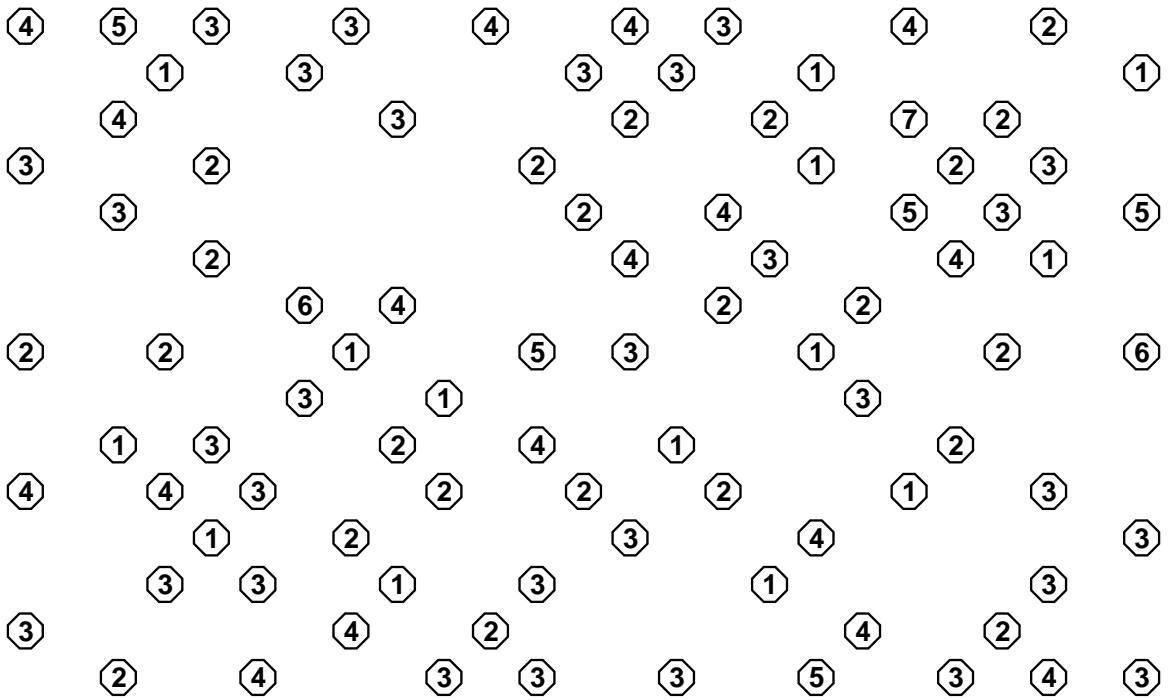


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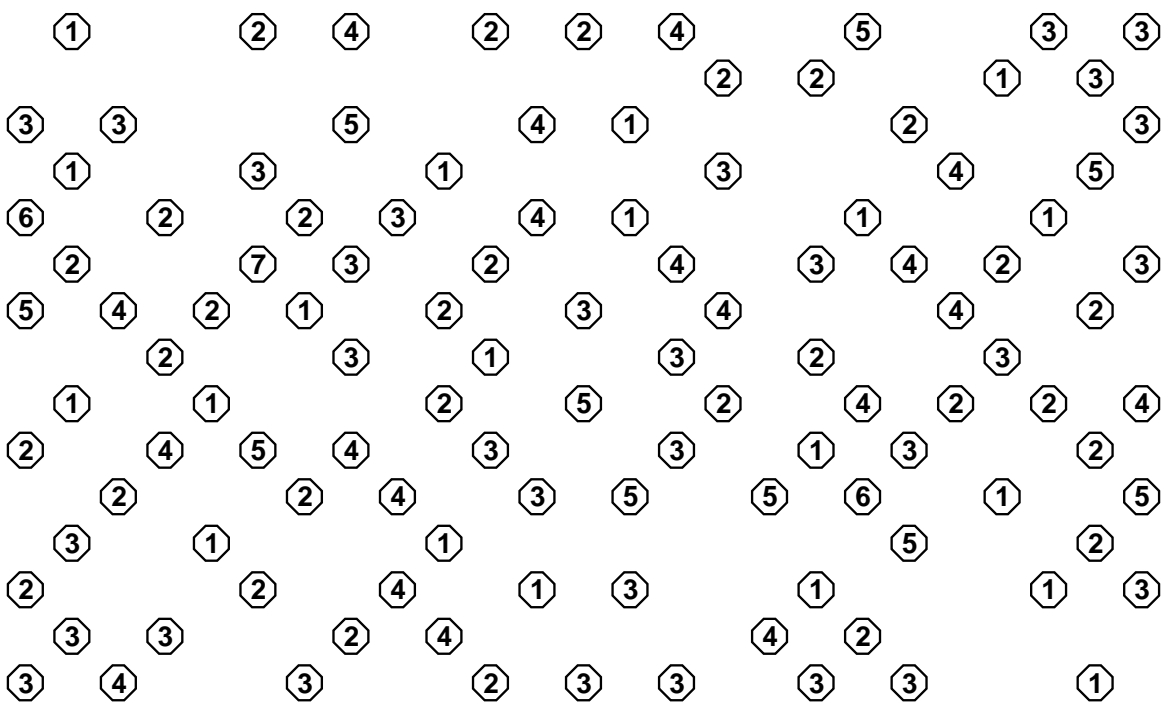


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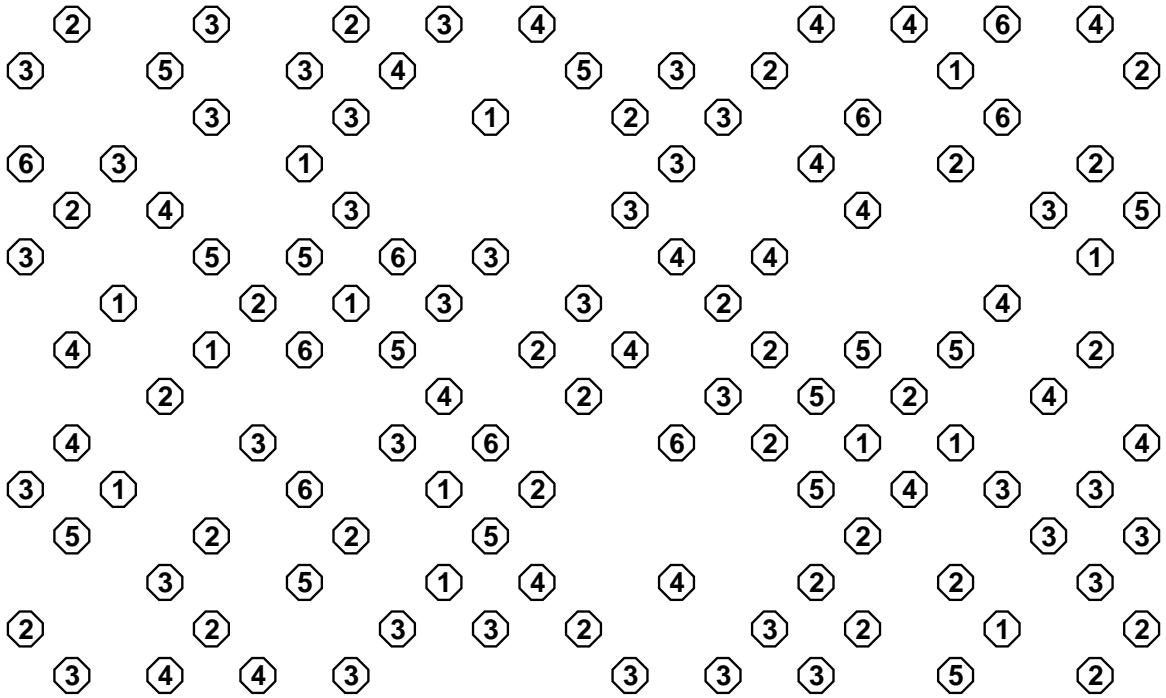


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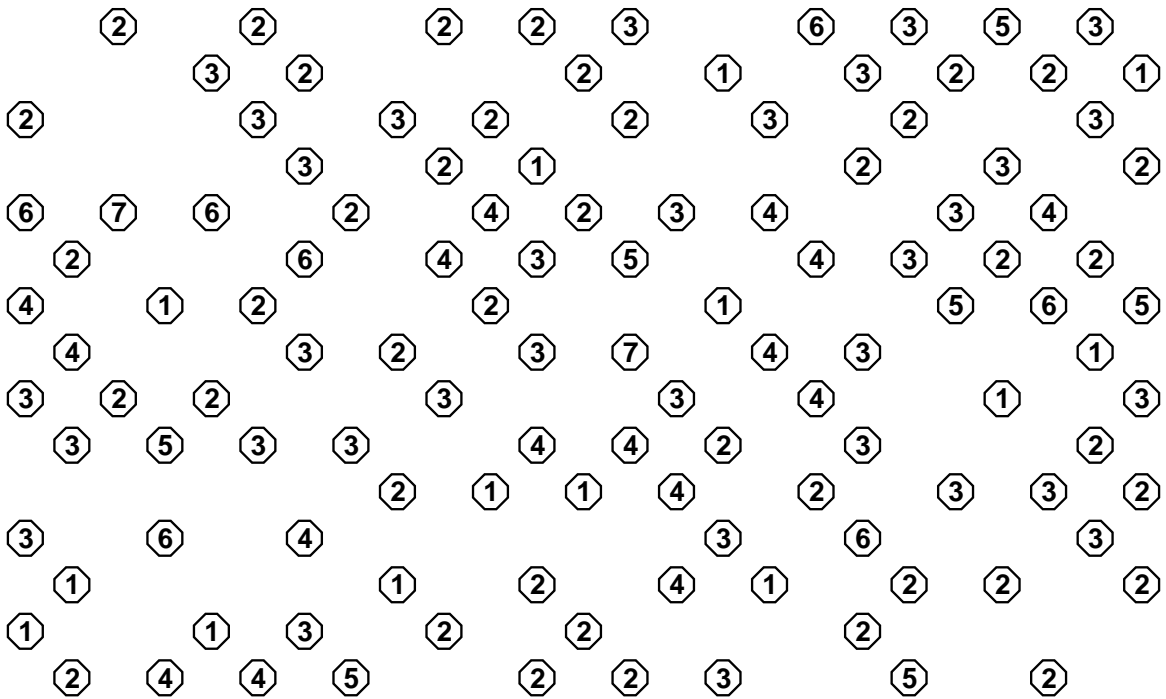


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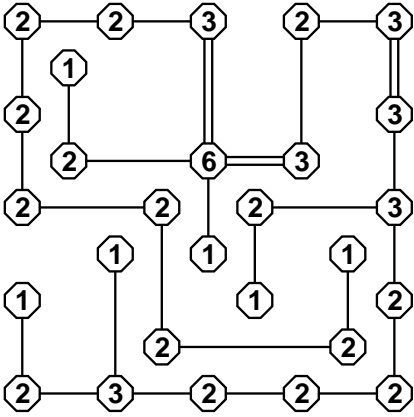


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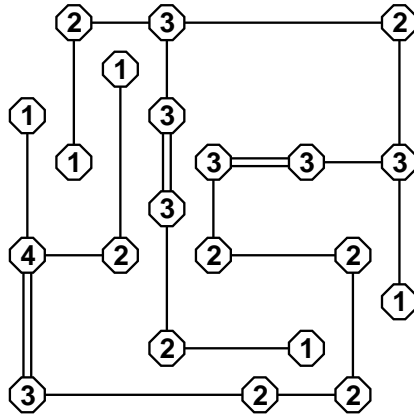
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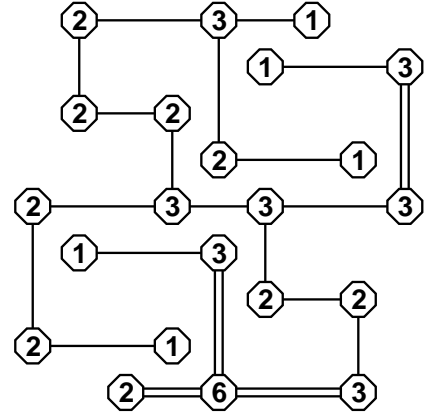
Bridges 9×9 Solutions



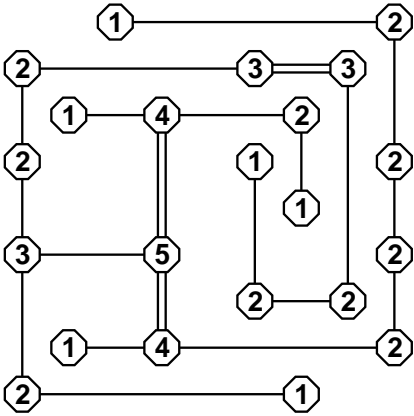
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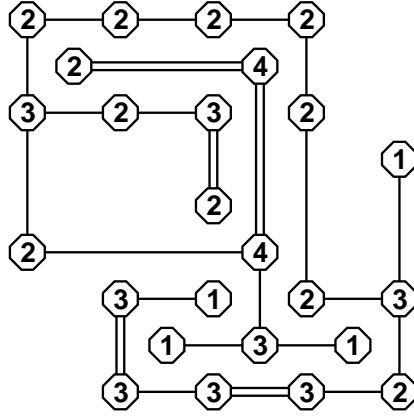
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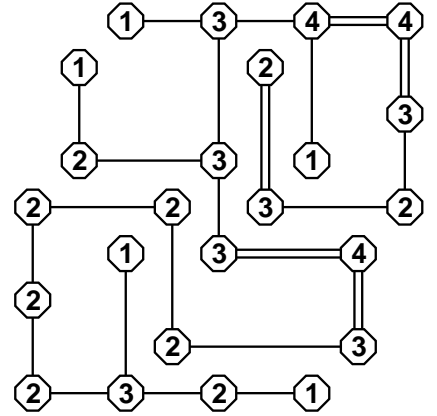
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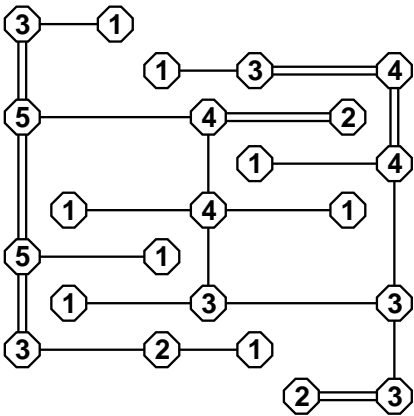
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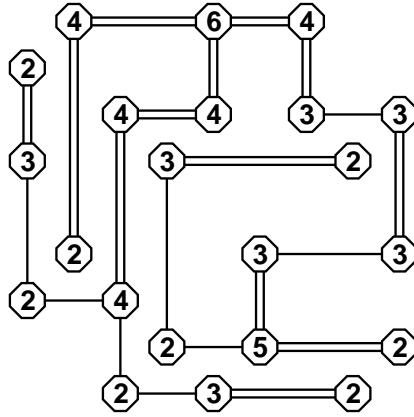
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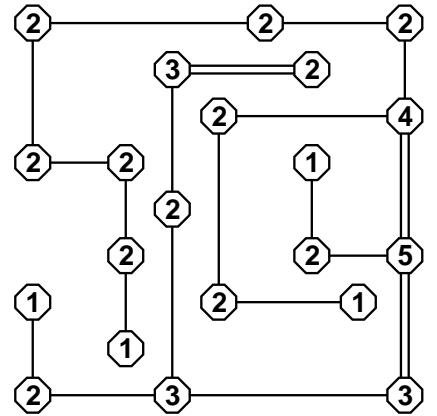
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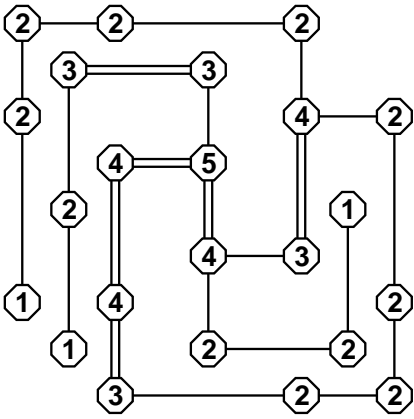


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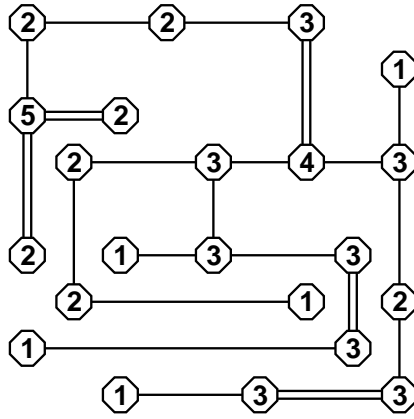


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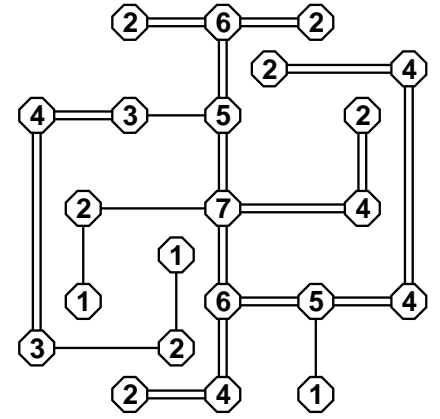
Bridges 9×9 Solutions



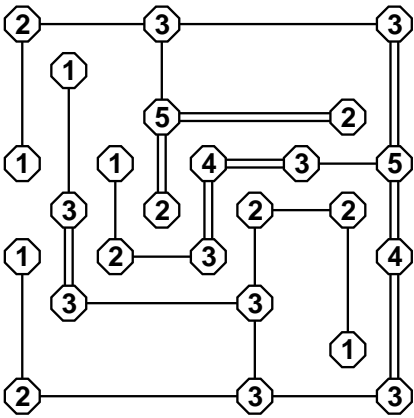
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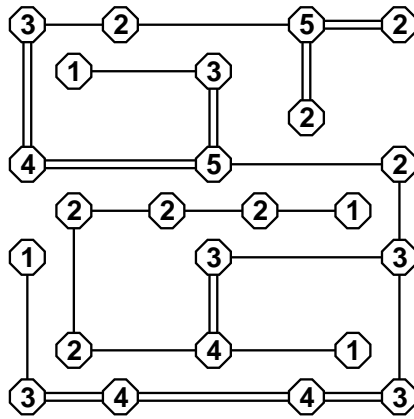
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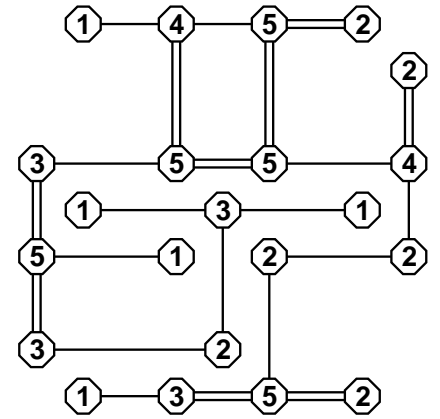
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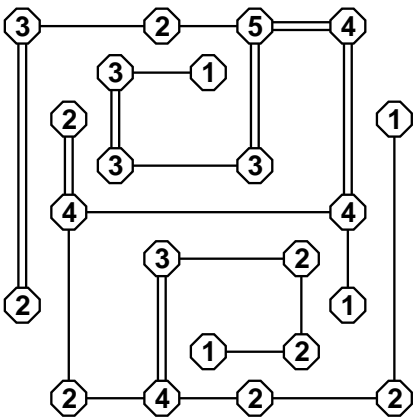
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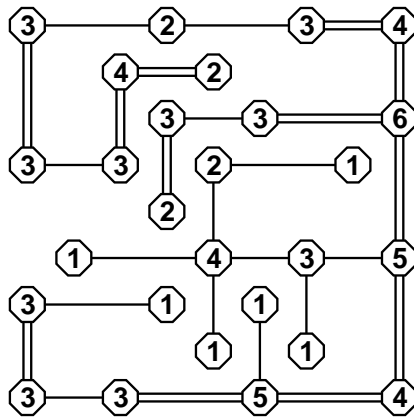
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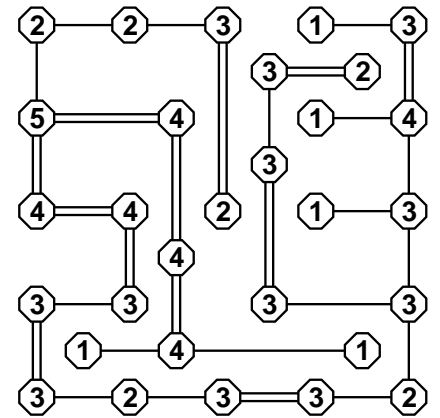
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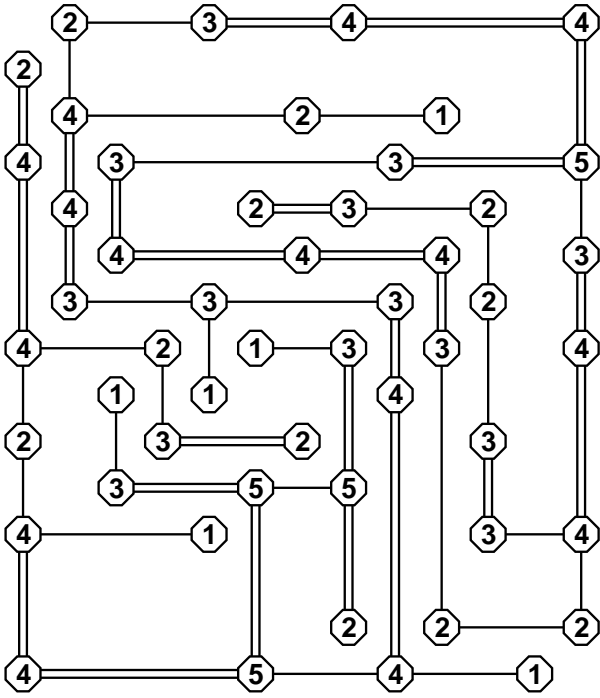


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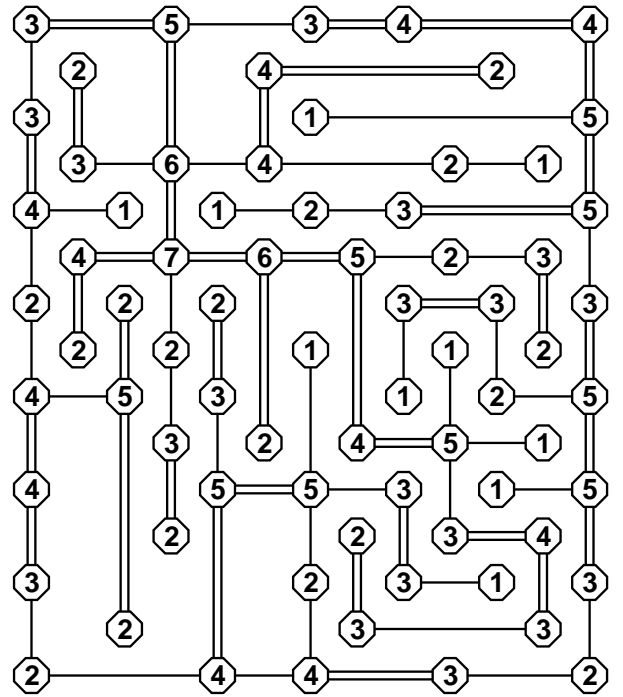


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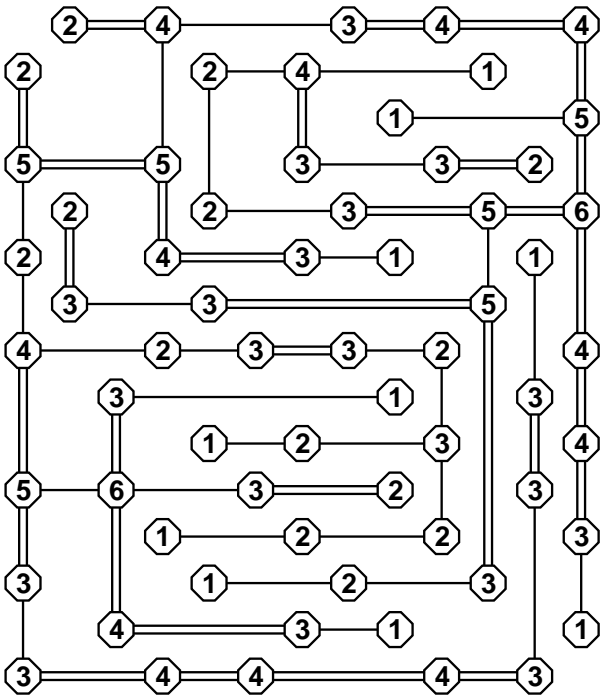
Bridges 13×15 Solutions



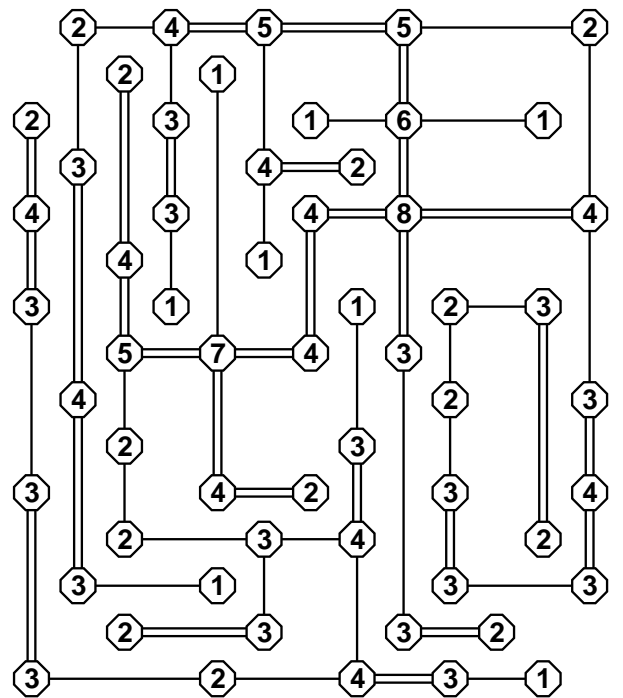
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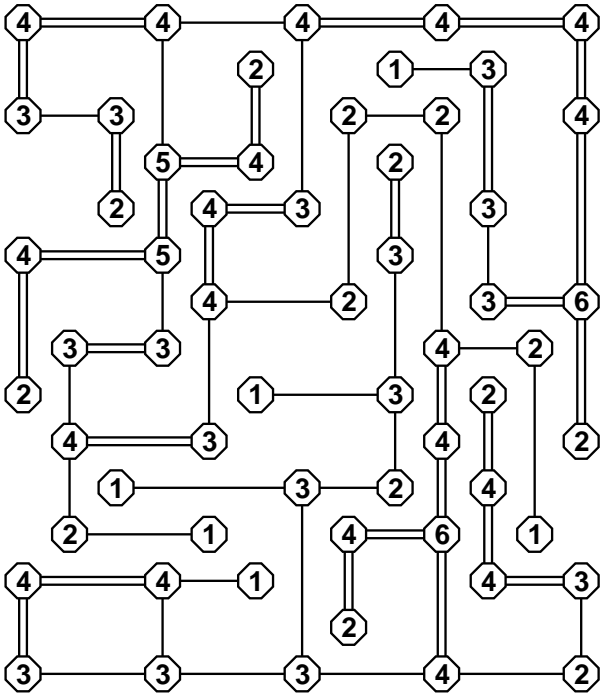


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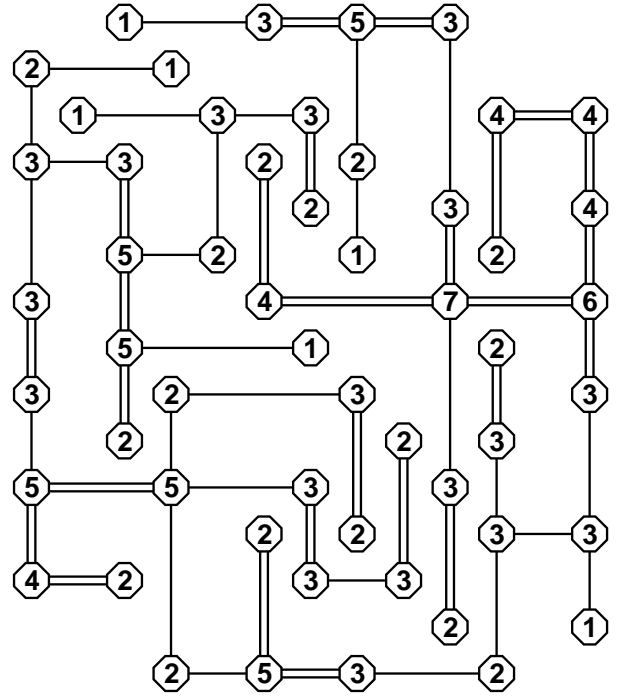


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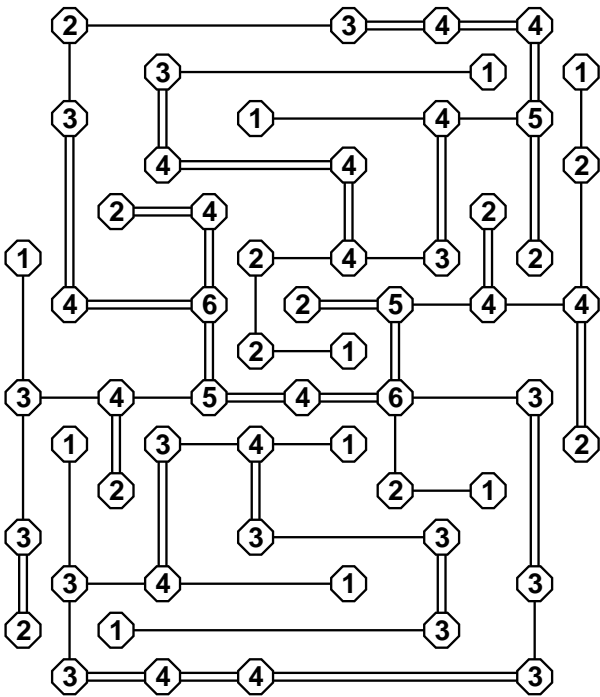
Bridges 13x15 Solutions



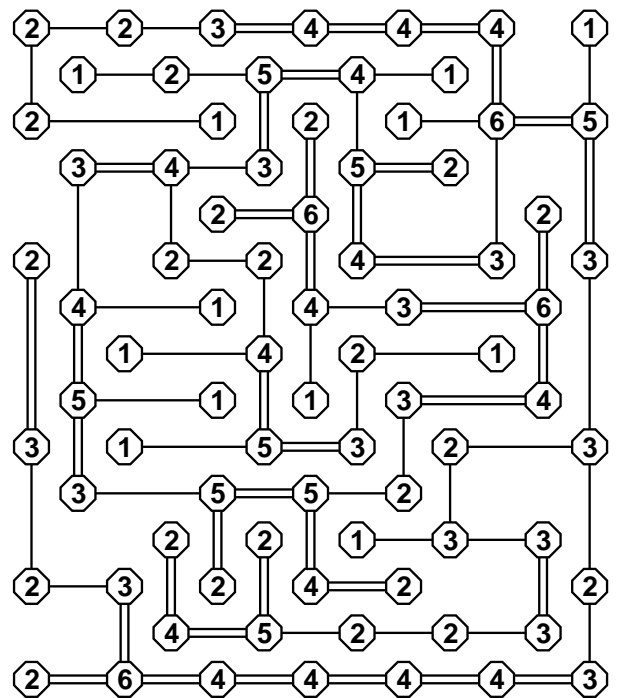
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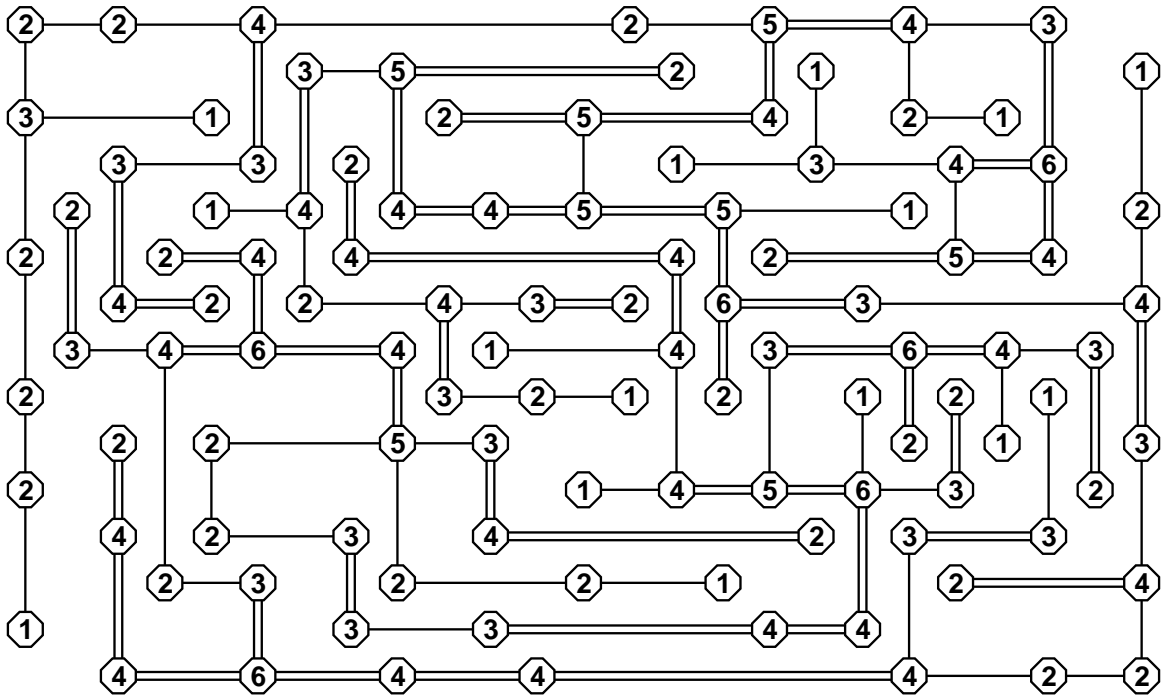


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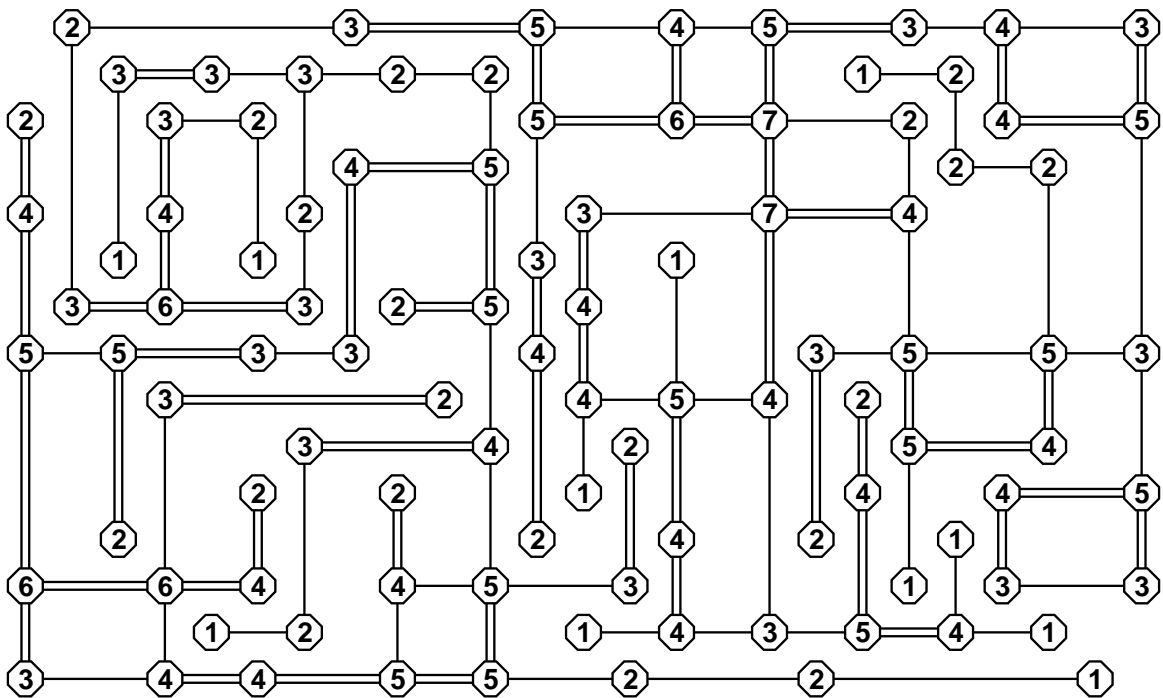
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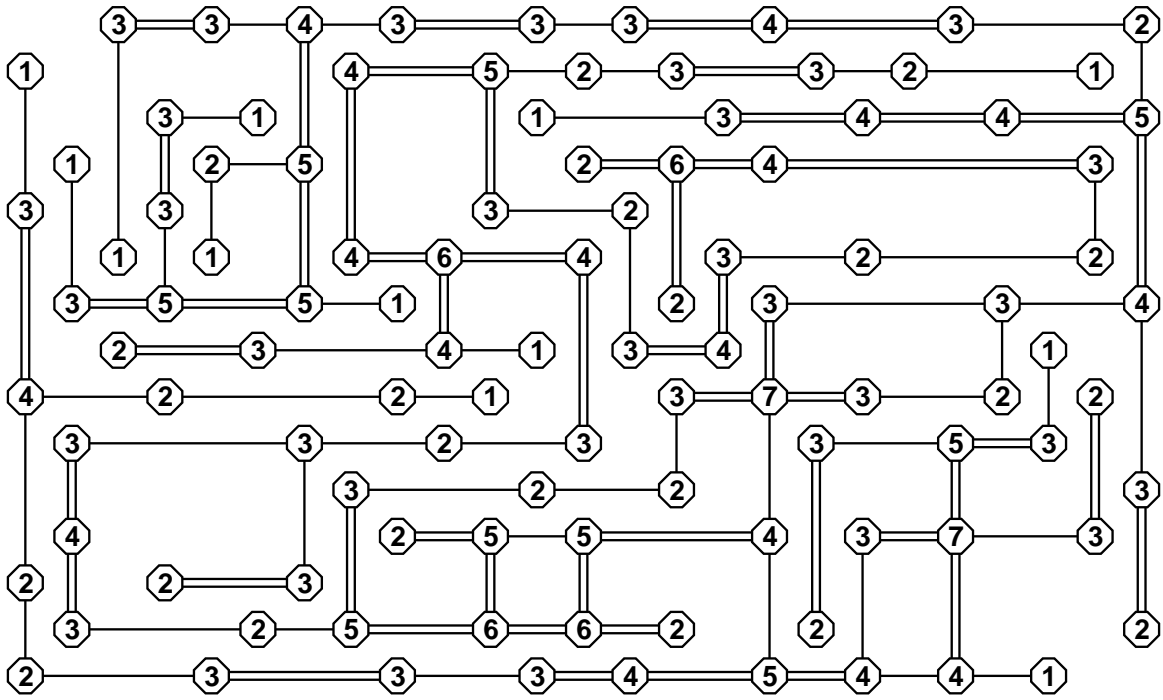


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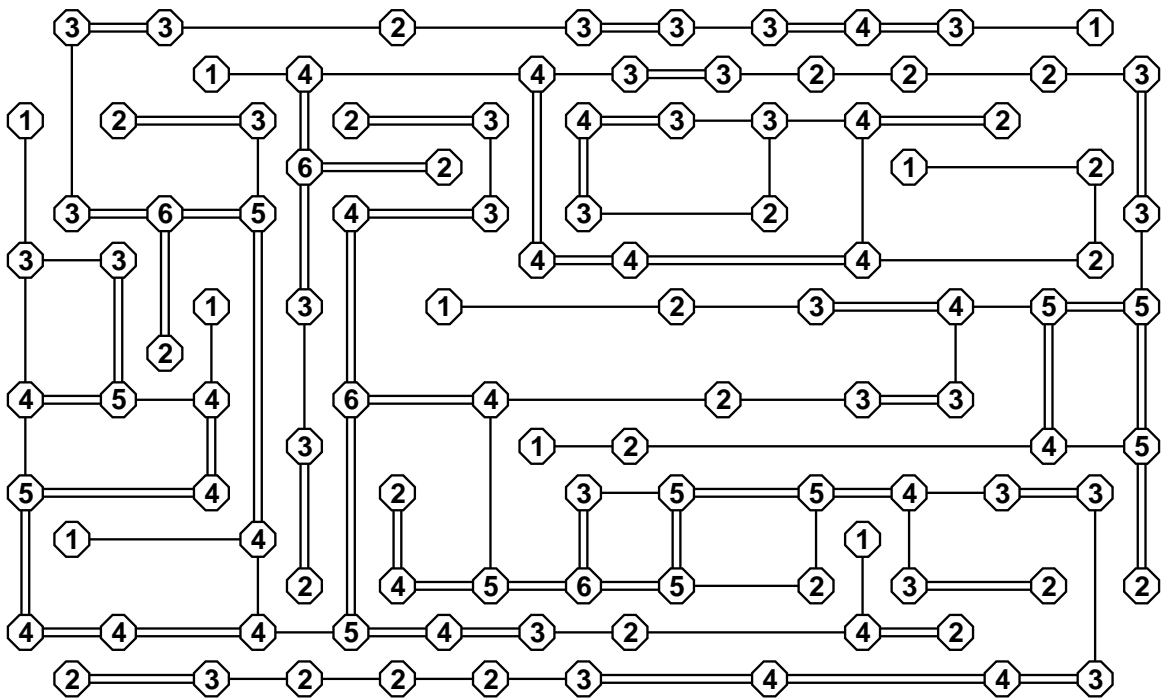


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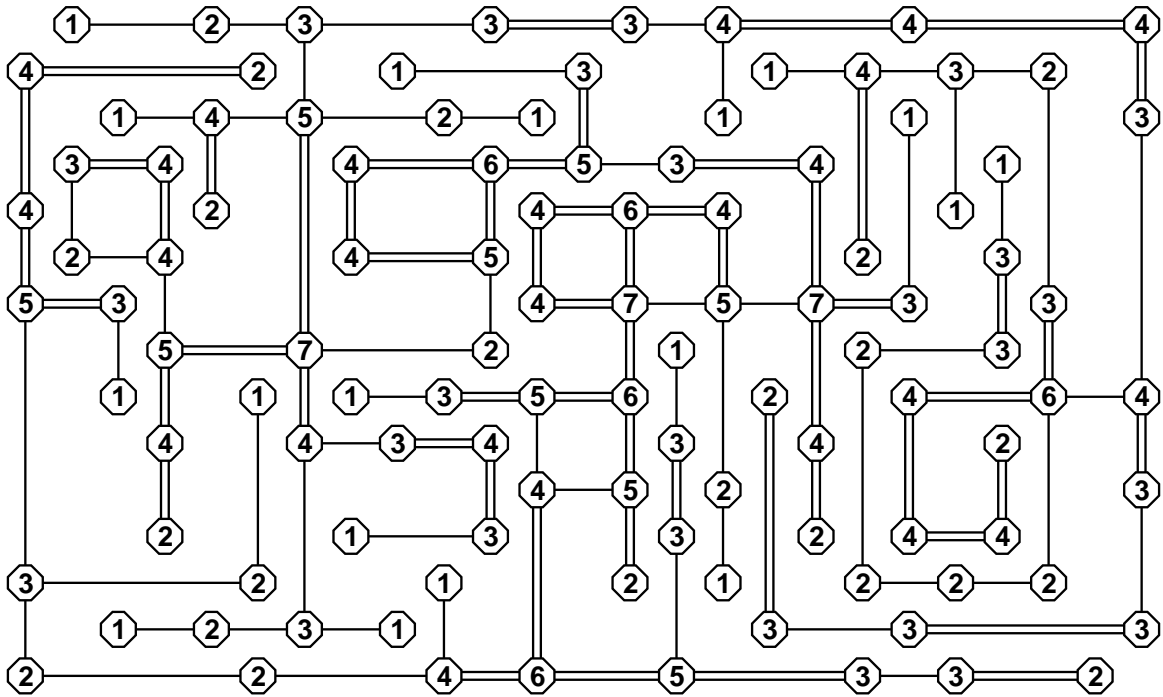


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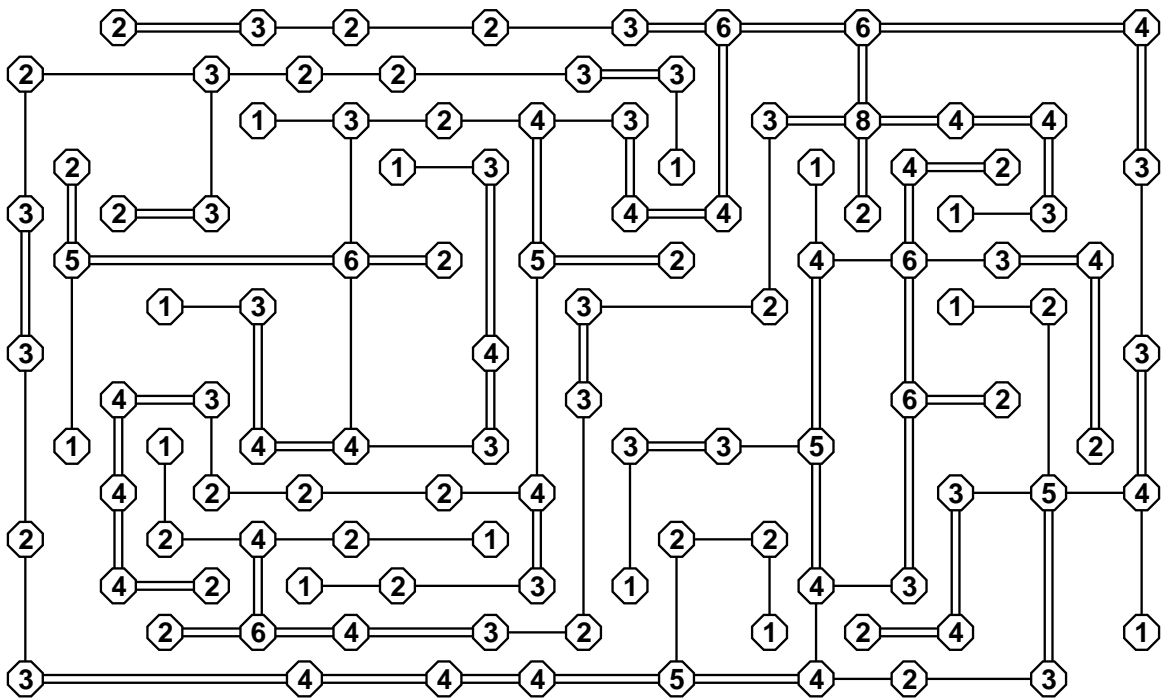


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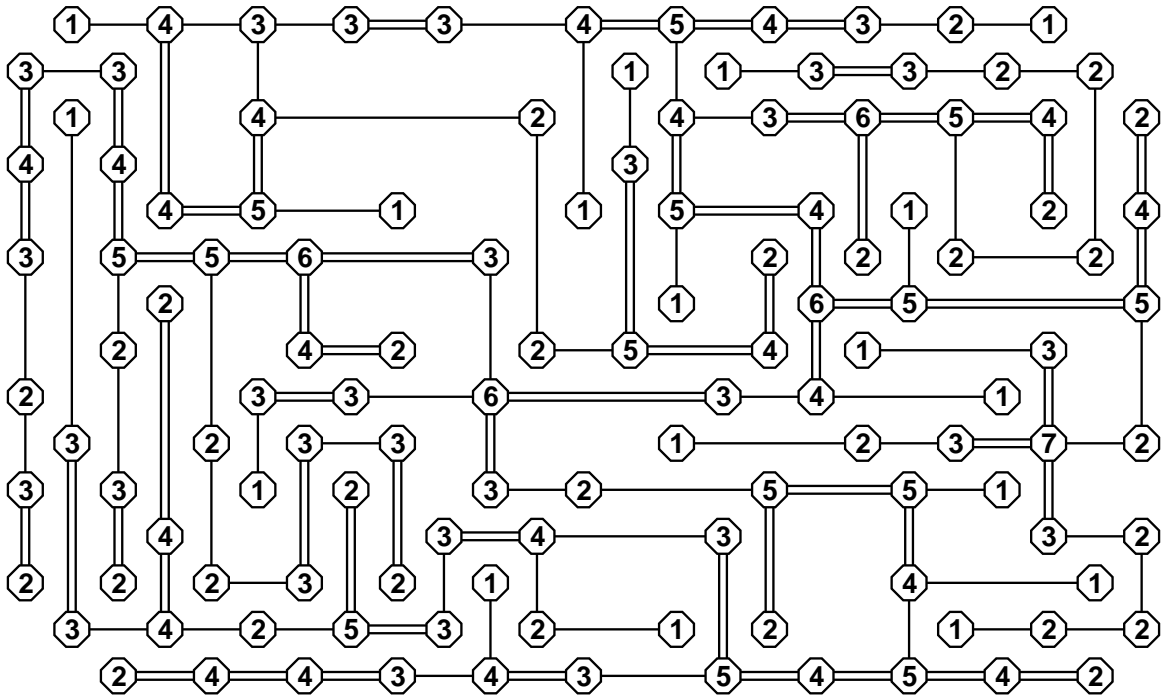


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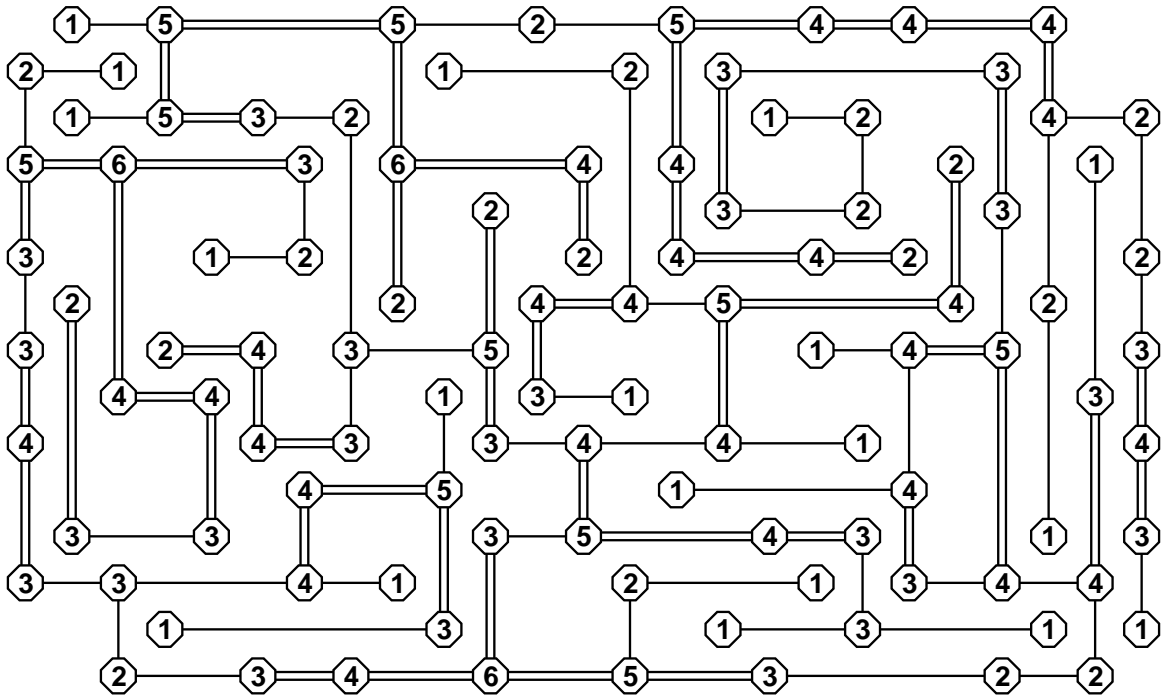


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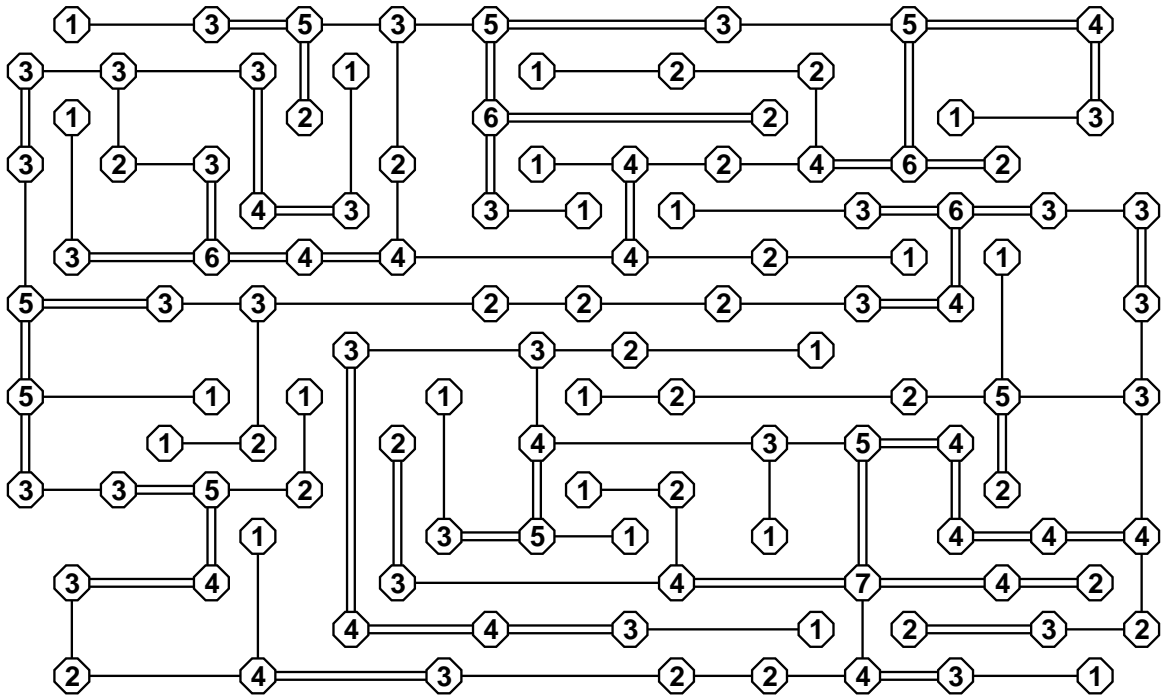


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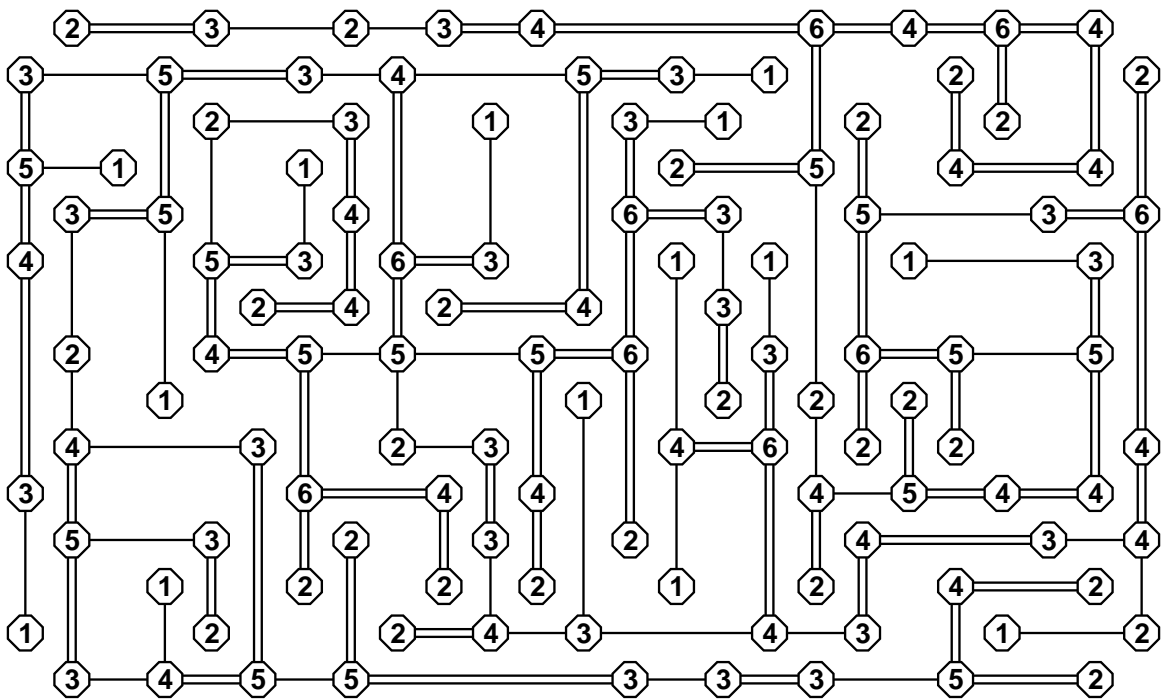


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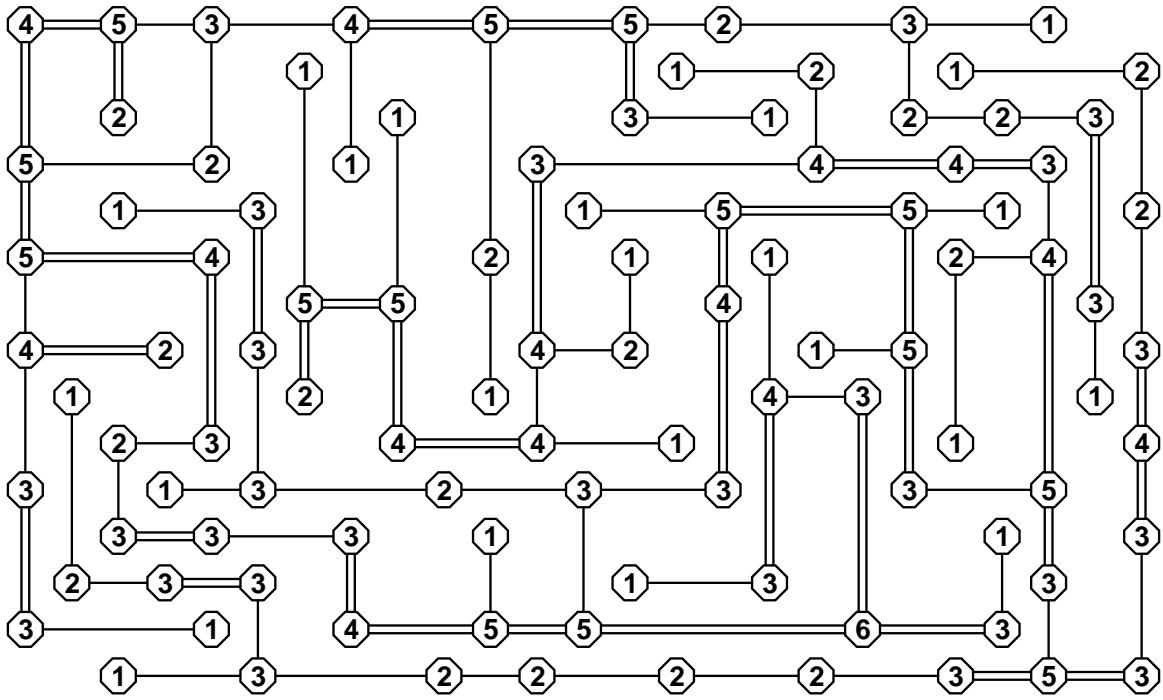


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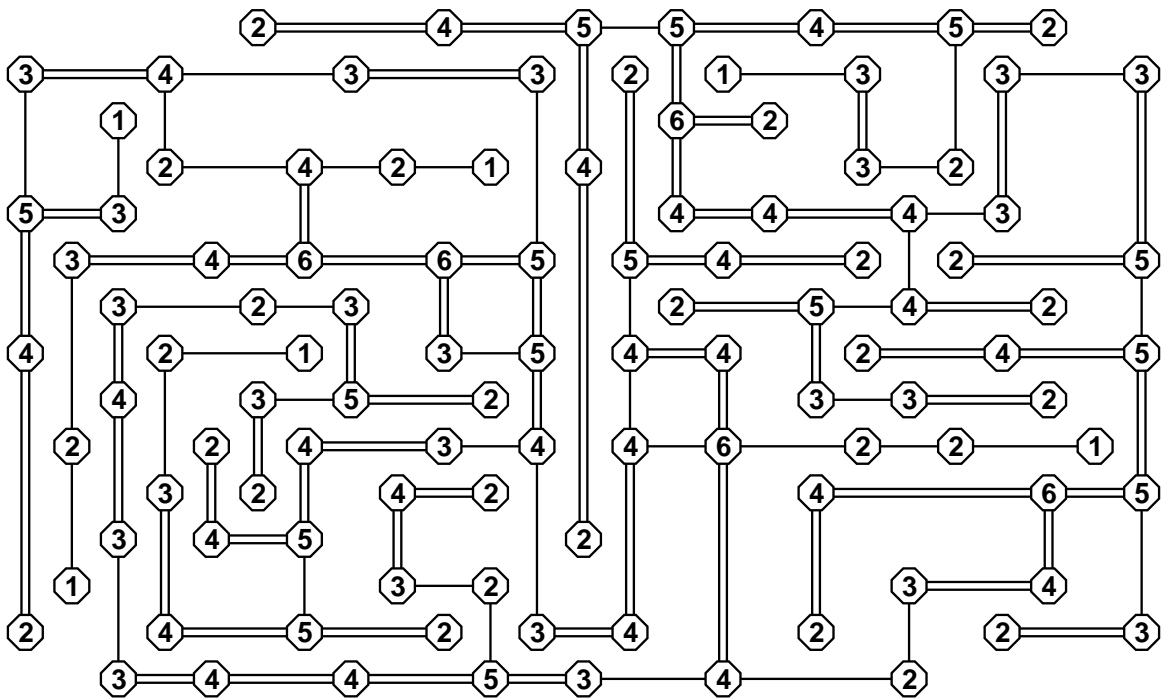


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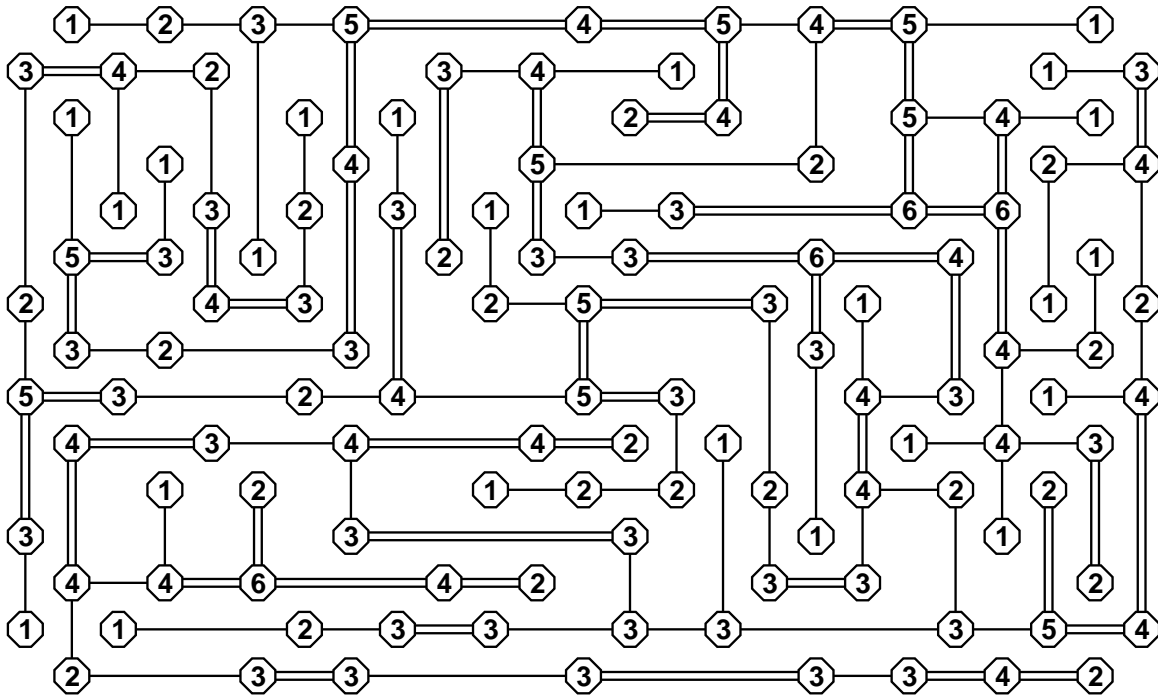


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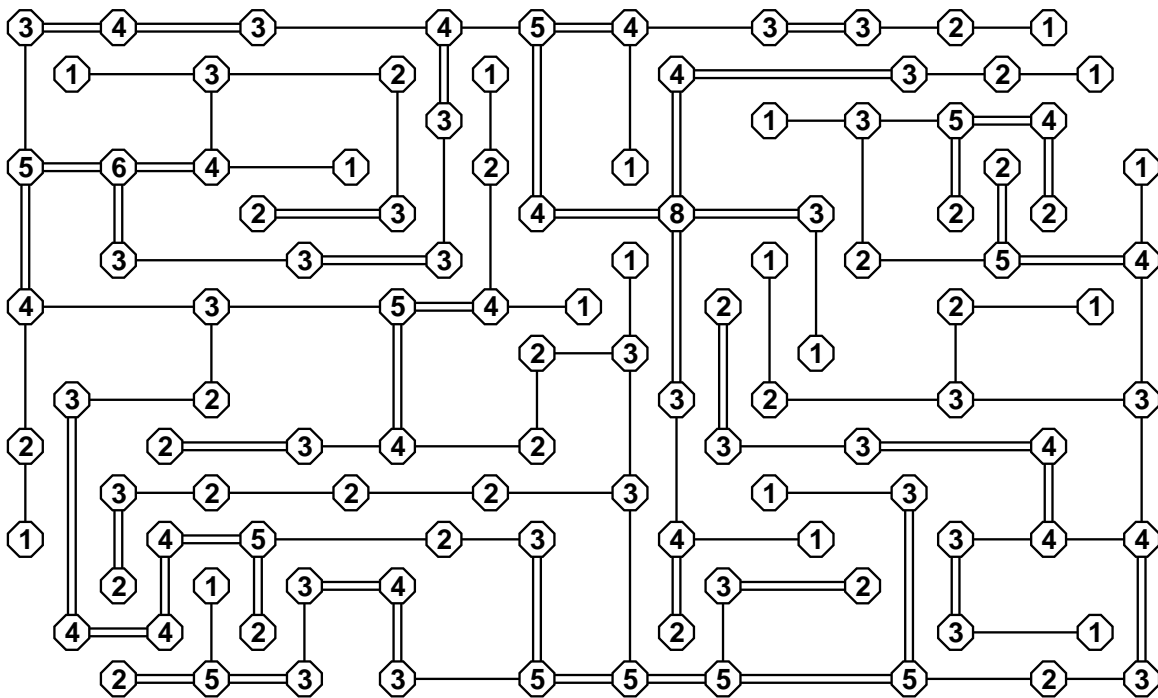


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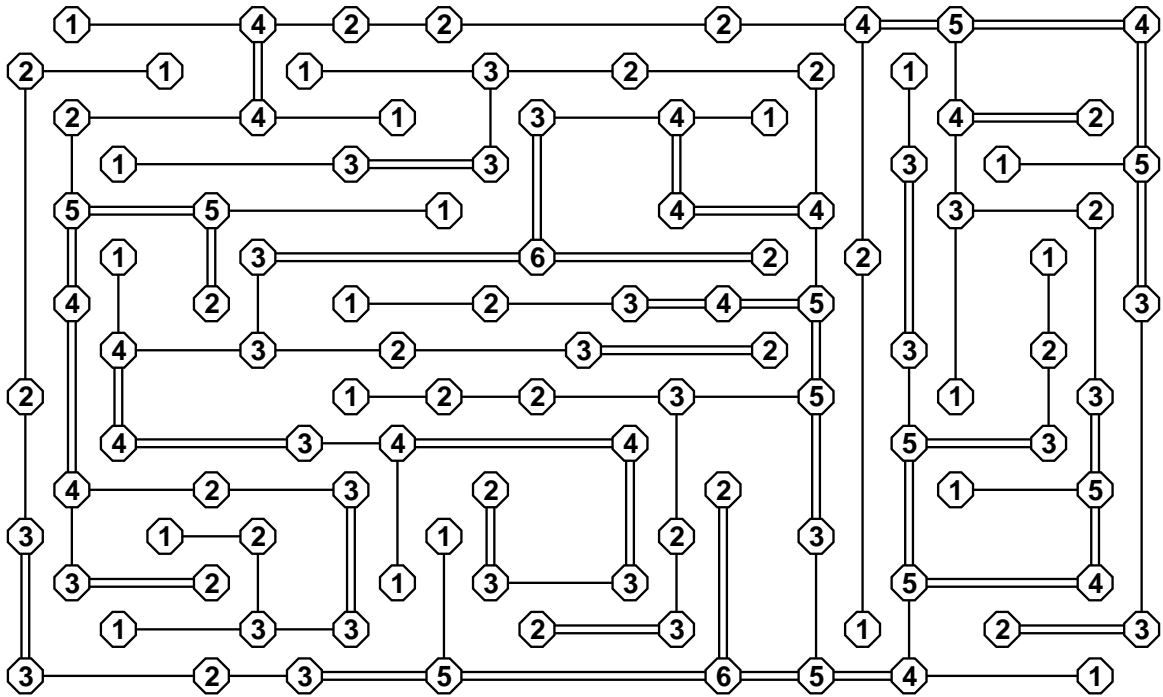


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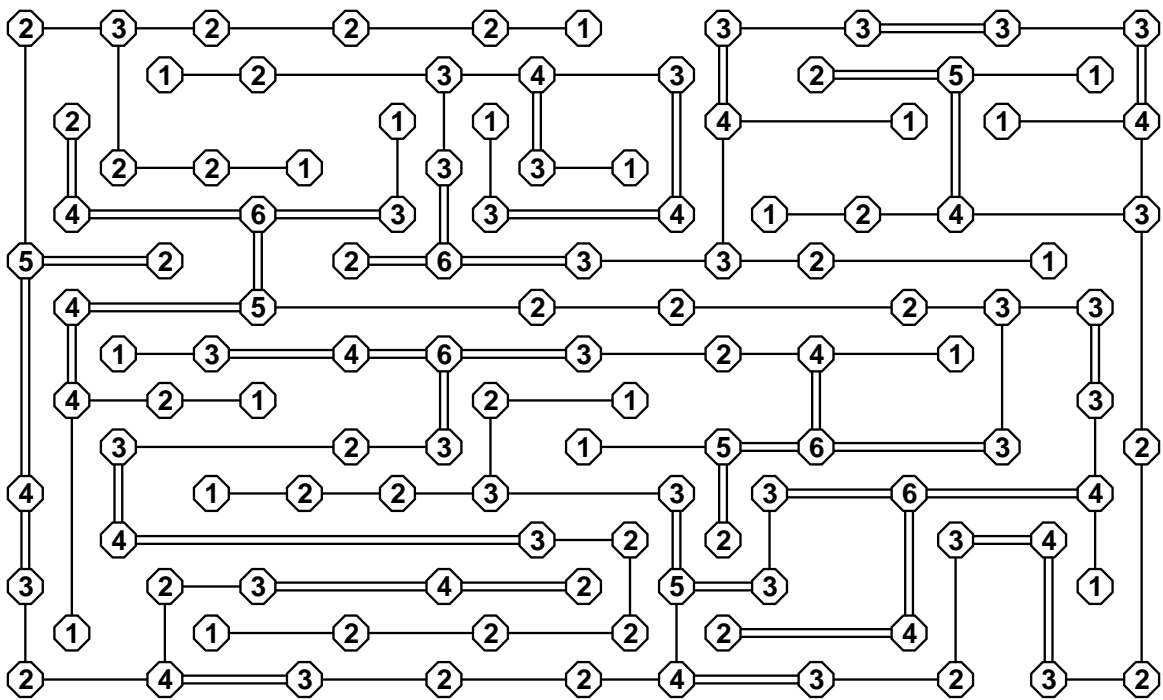


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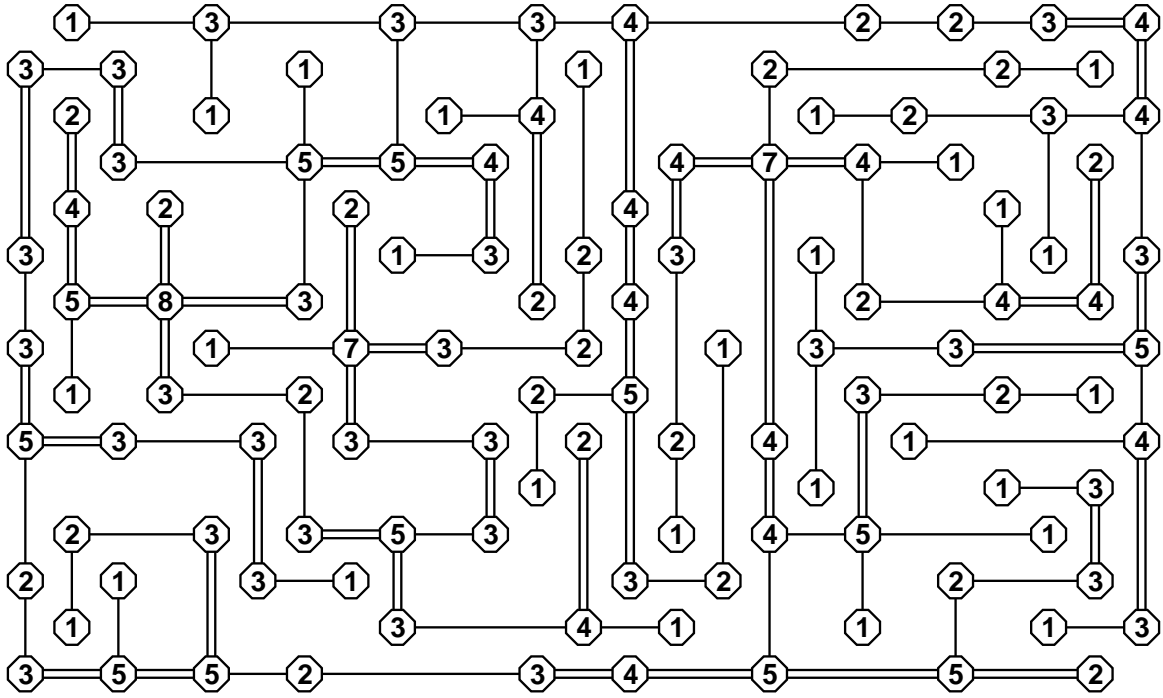


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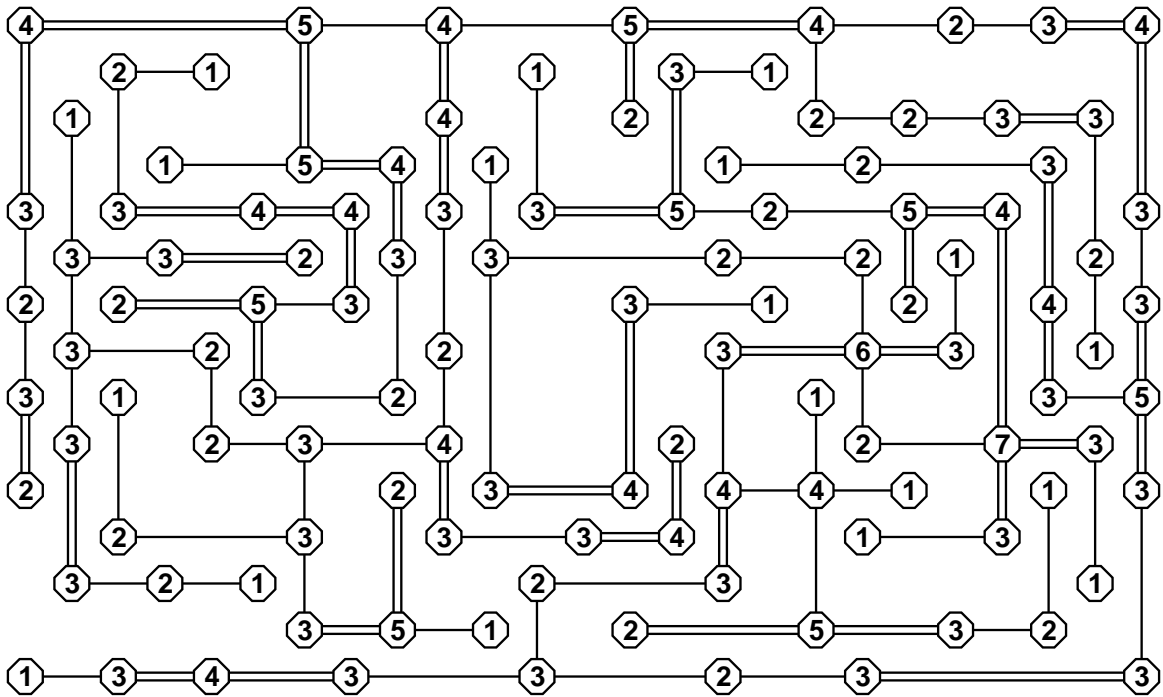


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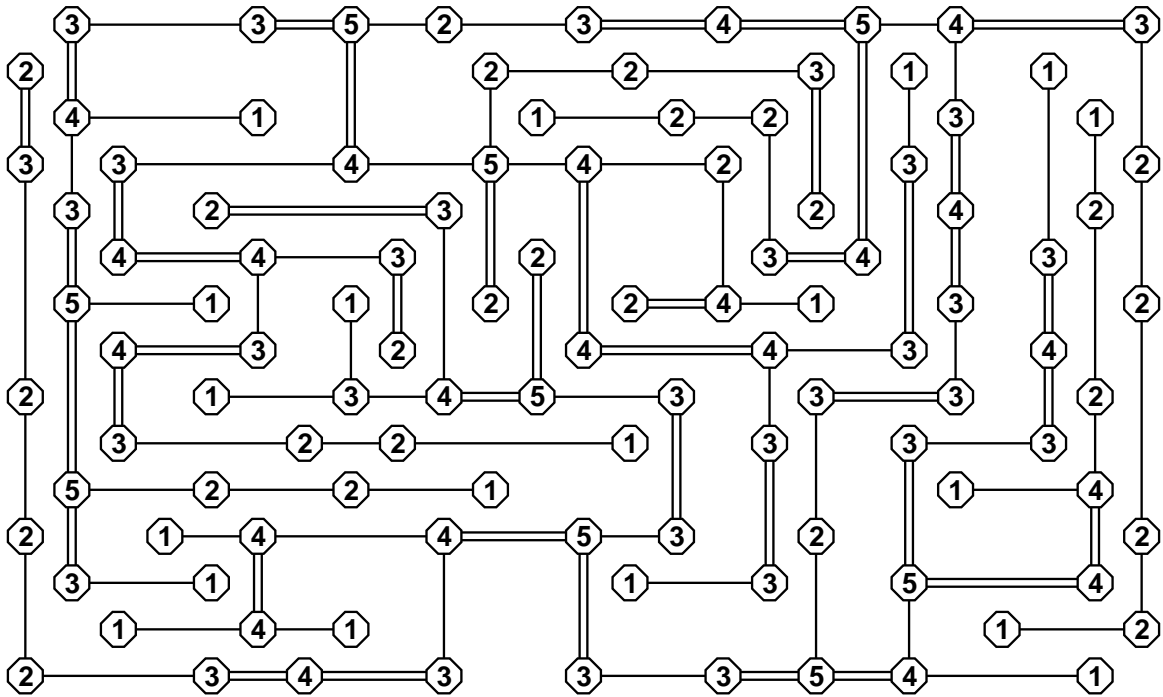


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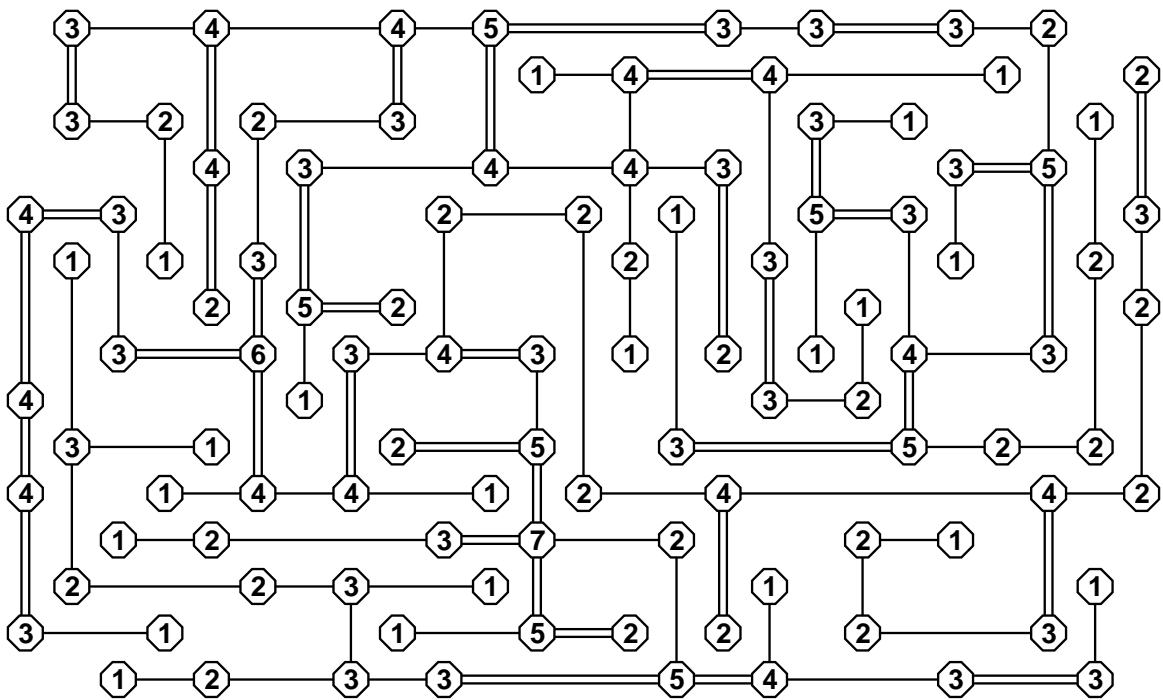


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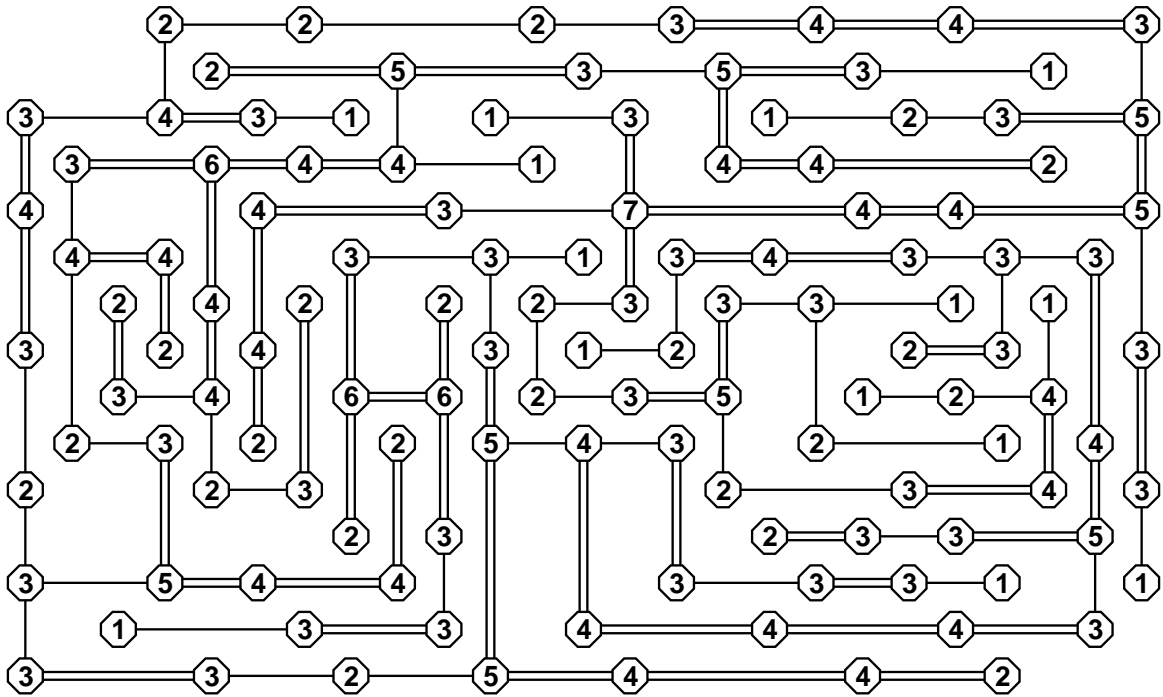


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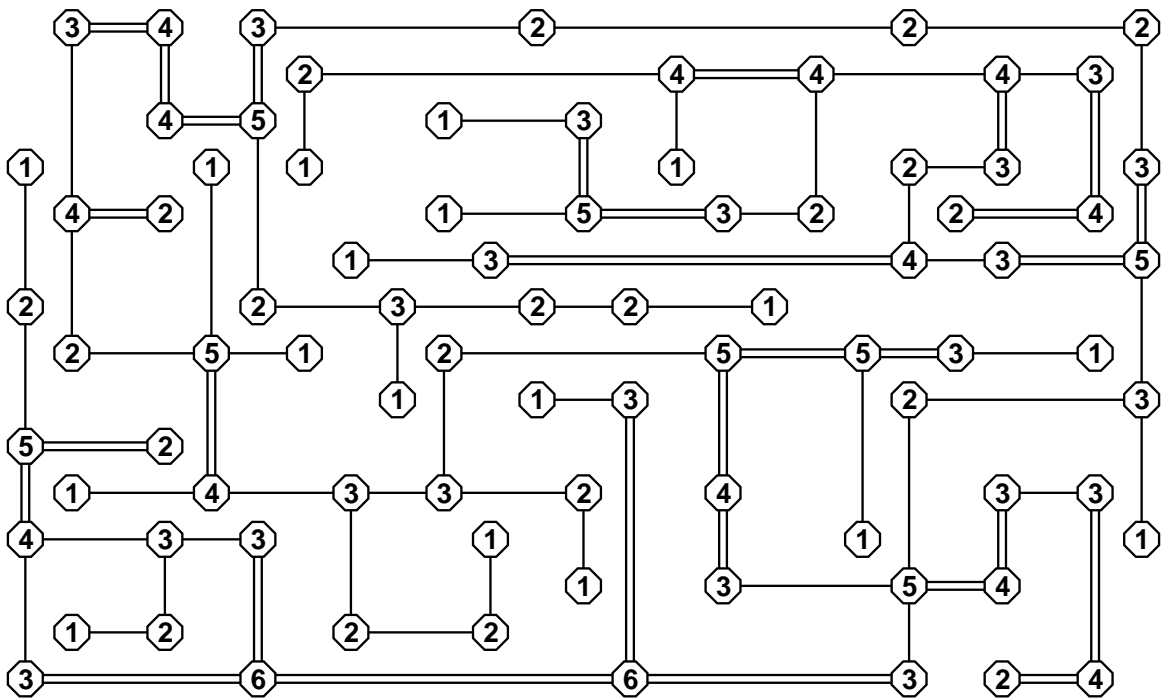


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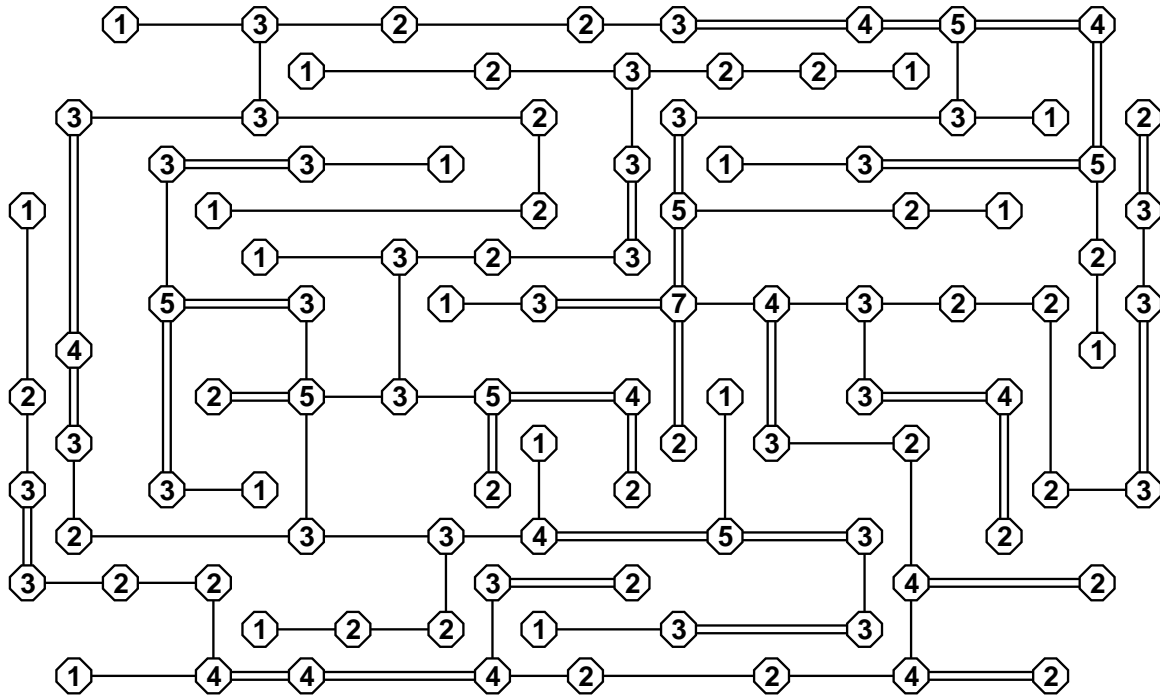


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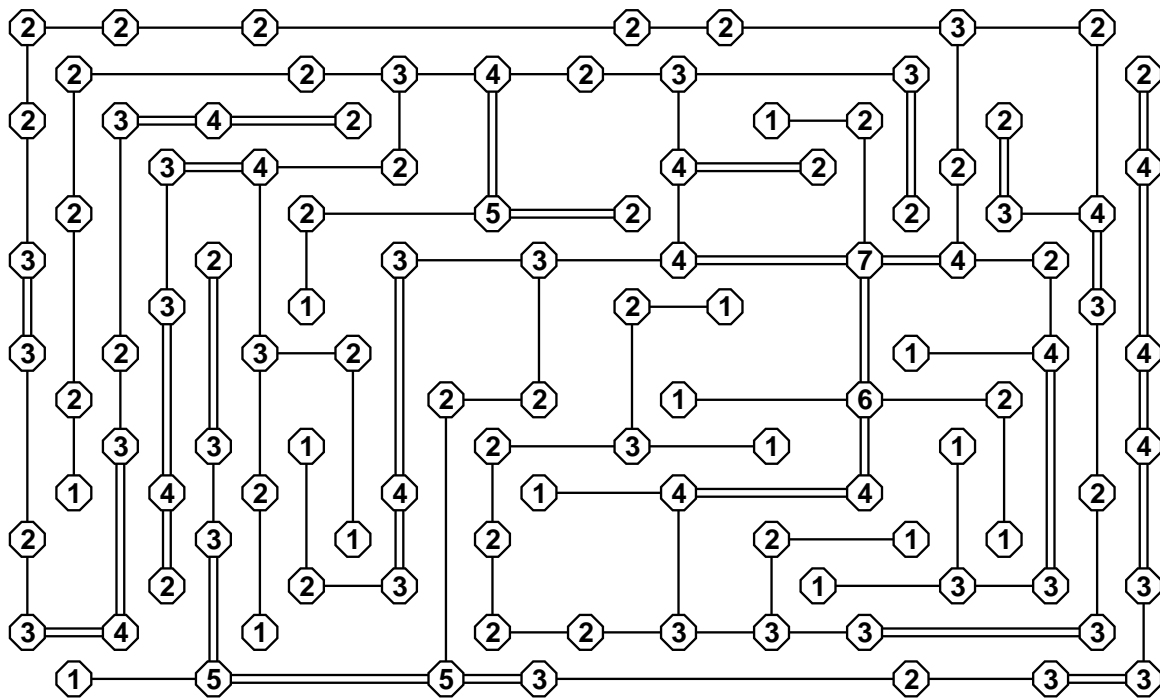


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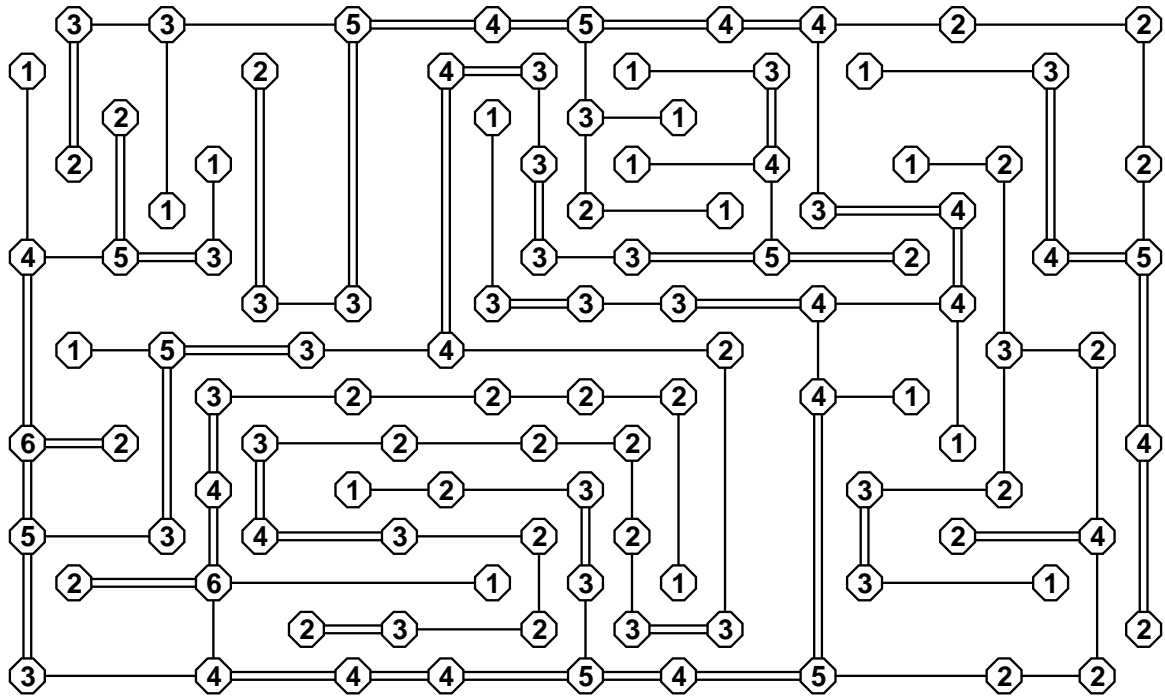


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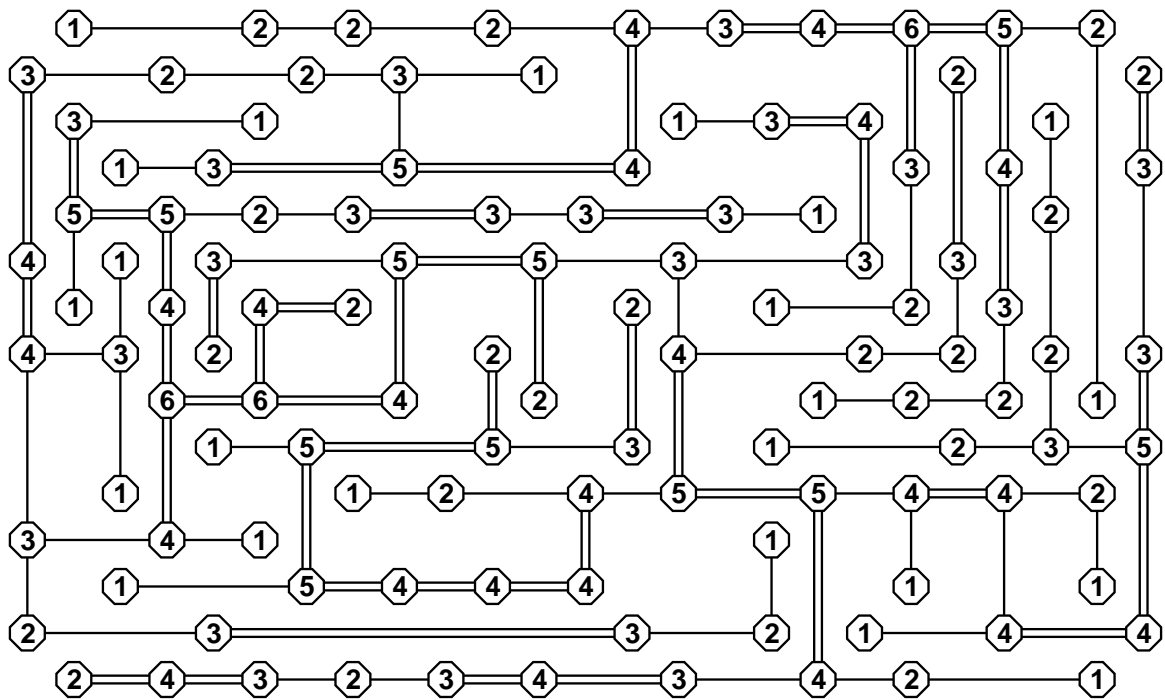


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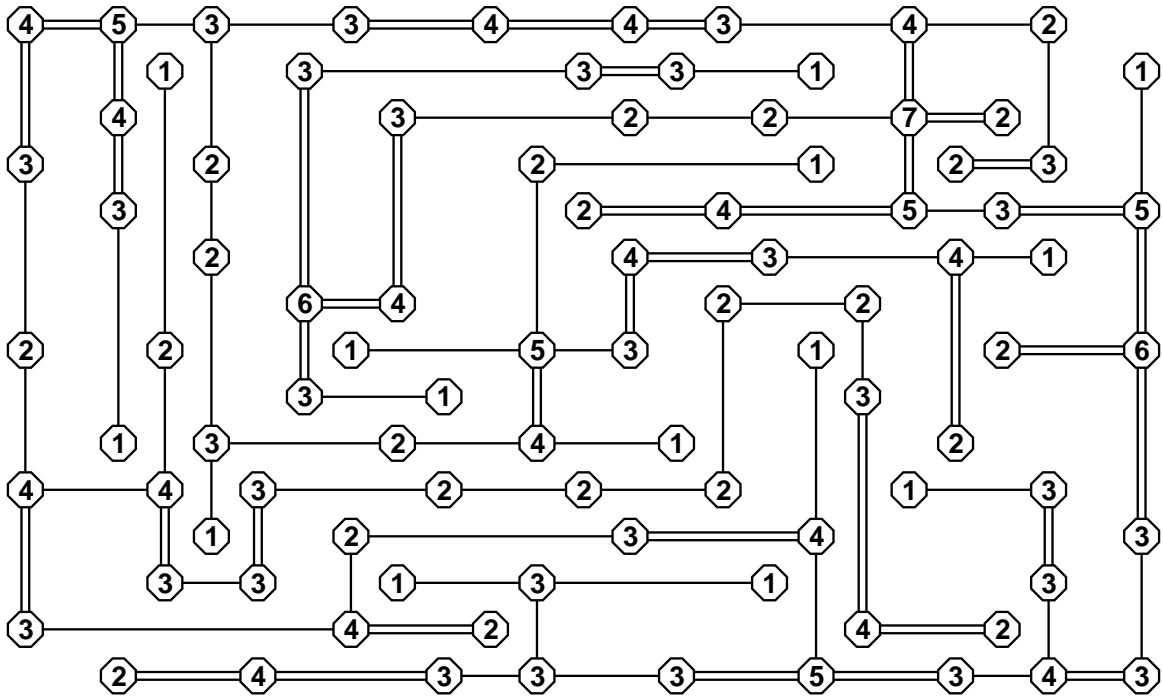


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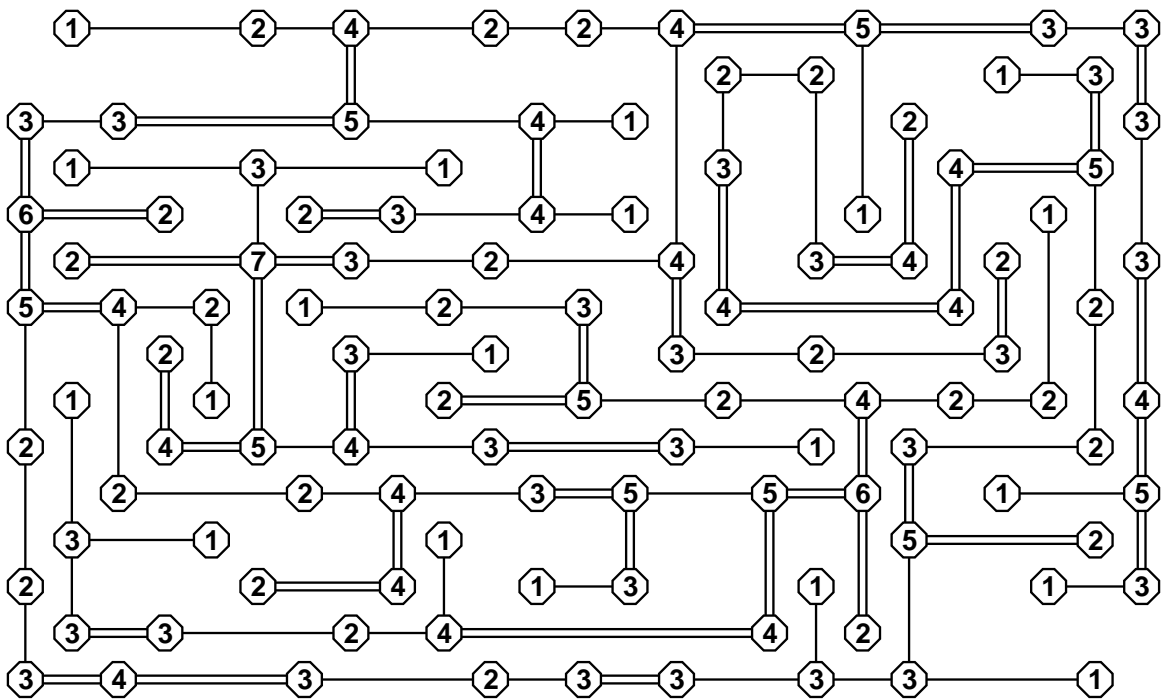


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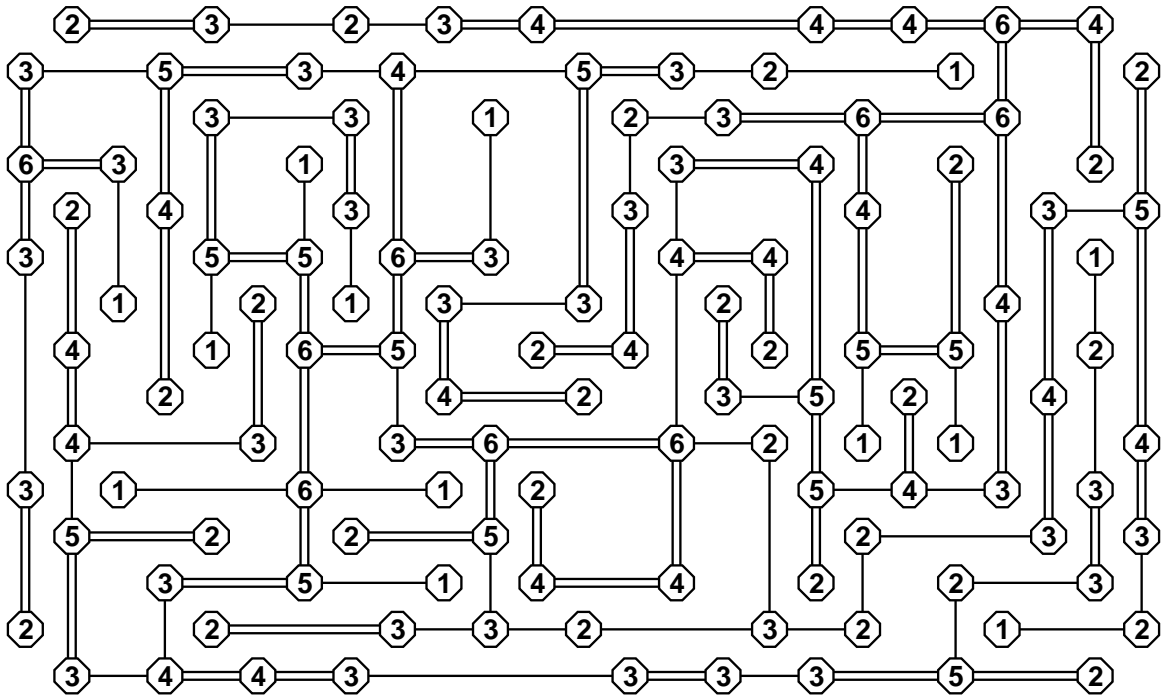


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