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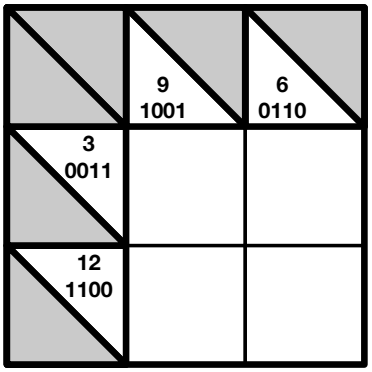
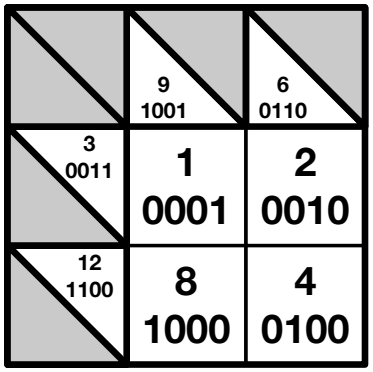
Bakuro

Bakuro or Revelations puzzles are binary versions of the popular Kakuro puzzle. The empty cells of the grid must be filled with the numbers 1, 2, 4 and 8 (i.e., only powers of 2). As with Kakuro, the numbers in each block in a column or row must add up to the number given in the clue above or to the left, respectively. No number can be used twice within any sum. The clues are given in both binary and decimal. The answers must also be written in both binary and decimal.
Here is an example with solution and then one overleaf to try.





Logical Thinking
We can deduce the answer by noticing that the top row adds up to 3. The only way this can be done with the numbers 1,2,4 and 8 is with 1 + 2. Now the leftmost column must add up to 9, so it must be 1 + 8. The top left cell must hold a number from both those sums, which means it must be 1 (0001 in binary).

Now if the top left cell hold 1, then the top right cell must hold 2 (0010 in binary) to make the row add up to 3. Similarly, the bottom right column must be 8 (1000) to make the leftmost column add to 9. That leaves the bottom right cell. It must hold 4 as the bottom row has to add up to 12 (8 + 4). That also makes the rightmost column add to 6 as required.

Computational Thinking Hint
Binary numbers are just a way of making up numbers by adding powers of 2 (1, 2, 4, 8, …) together, just like decimal numbers involve adding powers of 10 (1, 10, 100, 1000) together.

Have you noticed any patterns in the numbers? The answers that go in the grid only have a single 1 in their binary representation. The binary of the clue actually tells you which numbers you are looking for. 12 is 1100 in binary which says that 12 is made up of one 8 (1000) and one 4 (0100) with no 2s and no units, added together. The row must therefore hold an 8 and a 4. Similarly, 9 is 1001 in binary: one 8 (1000), no 4, no 2 and one unit (0001) added together, so its column must hold an 8 and a 1.

Try the Bakuro overleaf.

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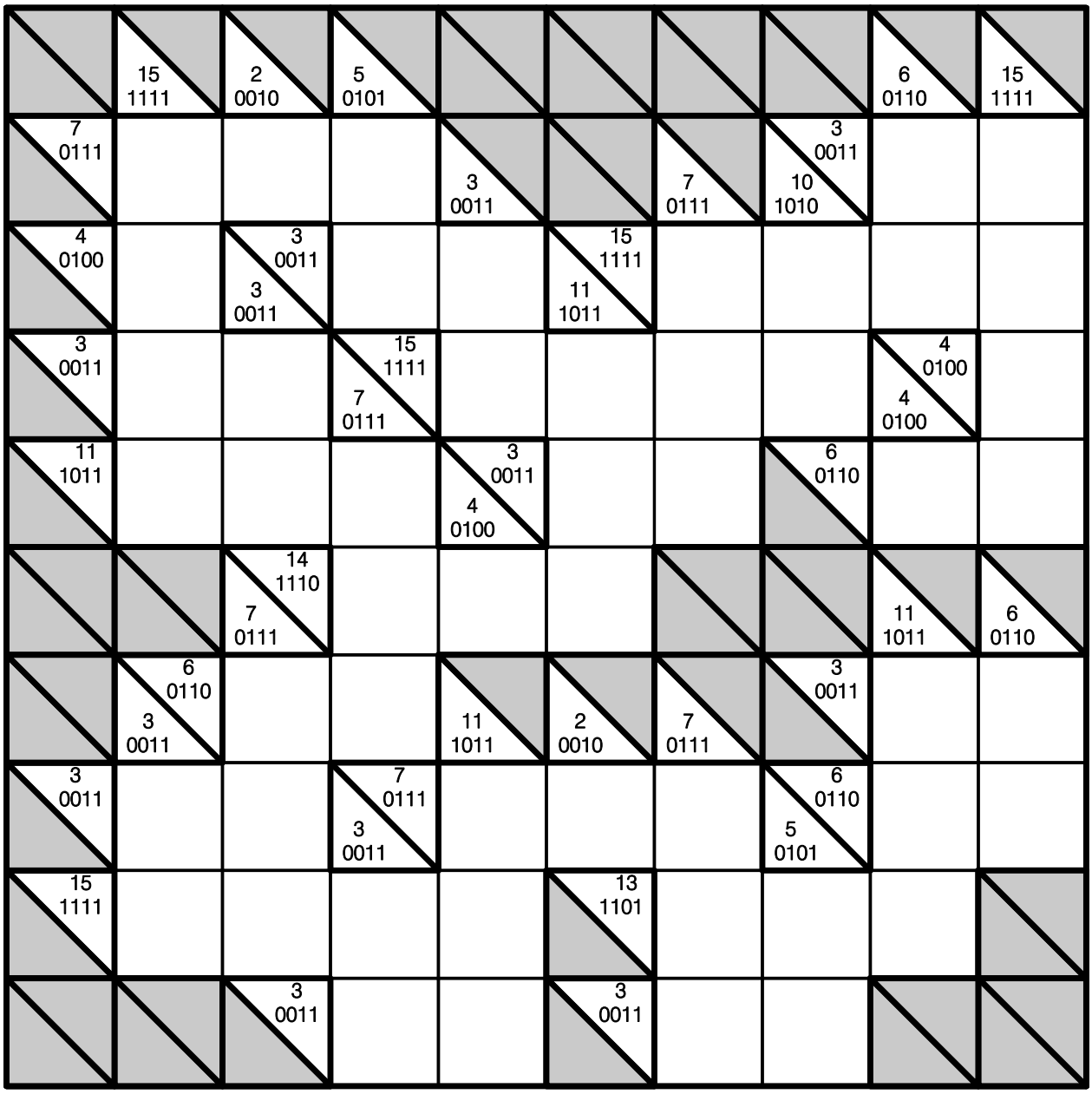
Bakuro 3

Fill the cells with the numbers 1, 2, 4 and 8, together with their binary equivalent. Each group of adjacent cells in a row must add up to the number in the clue to its left. Each group of adjacent cells in a column must add to the number in the clue above it. No group may contain the same number more than once.



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