Twins – Full Solution Guide

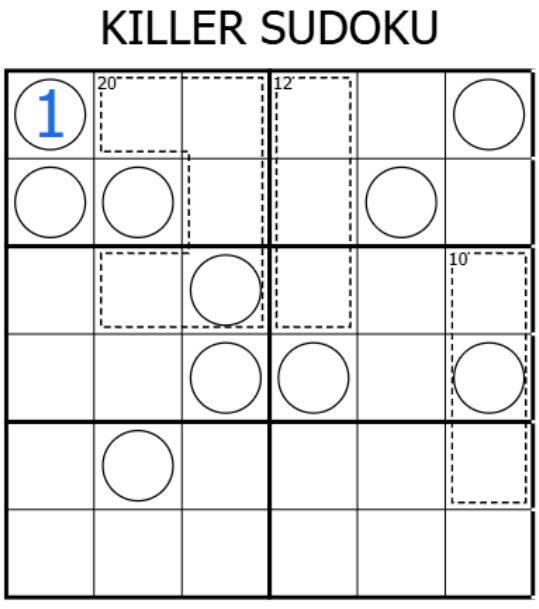
This is a full solution guide to my puzzle *Twins*, and so spoilers are ahead.

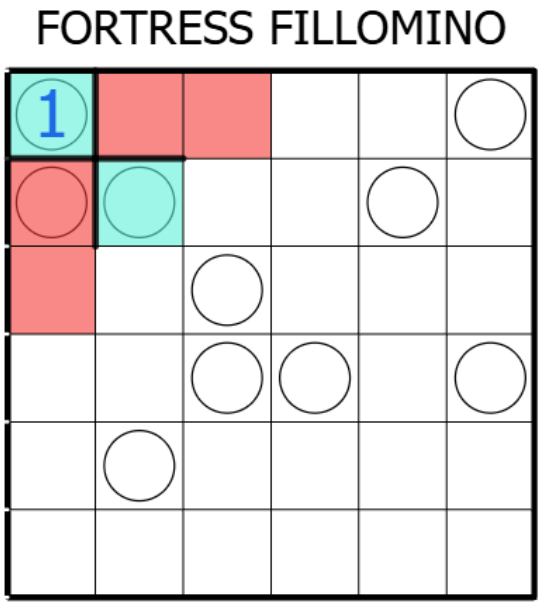
Rules

- This grid is two puzzles in one. The left grid is a standard 6x6 killer sudoku, the right is a fortress fillomino
- Two circles in the same relative position in both grids must contain the same digit
- SUDOKU
    - Place the digits 1 to 6 once each in every row, column, and 3x2 box
    - Digits do not repeat in a cage and sum to the total in the top left corner
- FORTRESS FILLOMINO
    - Divide the grid into orthogonally connected regions and fill each cell with a number (not necessarily single-digit) showing the number of cells in the region to which it belongs
    - Each region must be either strictly larger than all of its orthogonal neighbours or strictly smaller than all of its orthogonal neighbours

Solve Path

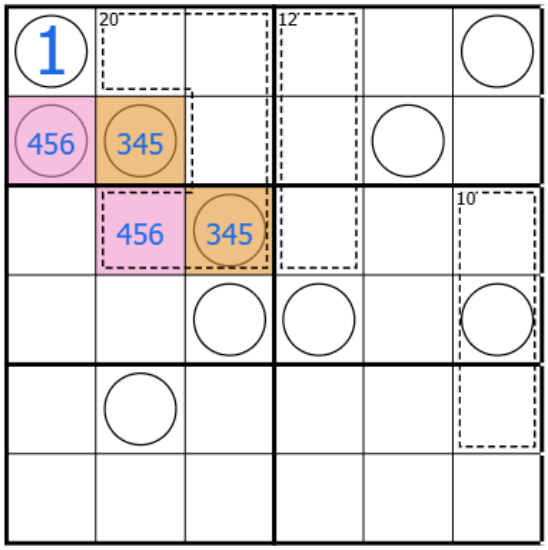
- (In this guide I will use S and F before the row/column indicator to specify whether this refers to the Sudoku grid or the Fillomino grid)
- There is a trick to solving fortress fillomino. Each region can be coloured one of two colours indicating whether it is a higher value region or a lower value region, and then the colours will make a pattern similar to checkerboard fillomino
- Could FR1C1 be high? By checkerboard, FR2C1 would be low, FR2C2 would be high, but FR1C1 would grow in to FR2C2 and make these the same digit which breaks the sudoku box
- So FR1C1 is low
- Following similar logic, this region can only be size 1



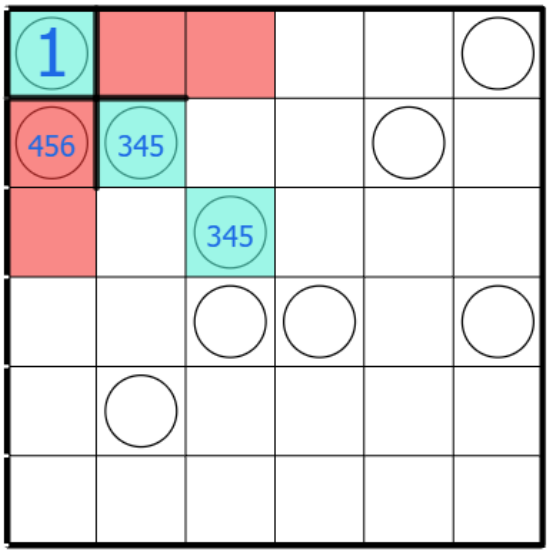


- Where is SR3C2 in box 1? It can't be in its own cage, and a 20 cage can't contain a 1, so it is in R2C1
- Where is SR3C3 in box 1? By similar logic it is in R2C2
- FR2C2 has to be more than 1, so it is going to grow in to FR3C3 making this one region

KILLER SUDOKU

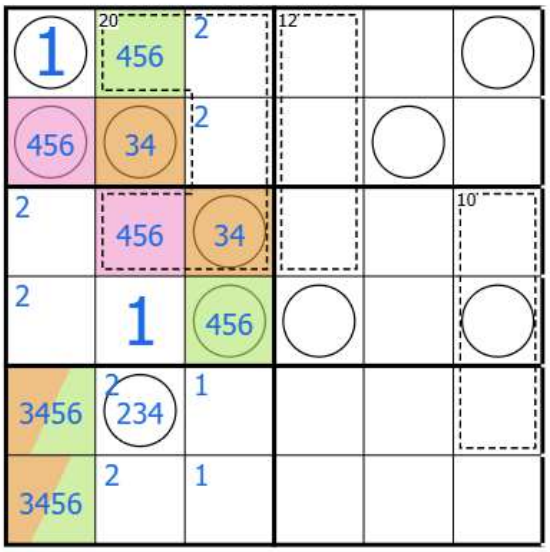


FORTRESS FILLOMINO

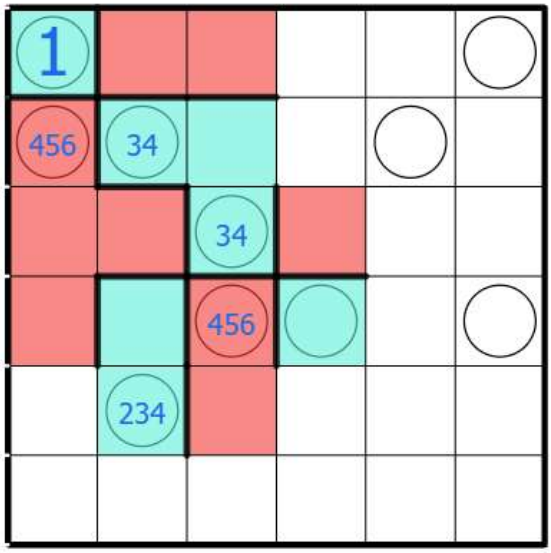


- FR4C3 must be high by checkerboard, and by sudoku this is a different digit to R2C1
- FR2C2 region is touching two different regions that are different sizes and no higher than 6, so R2C2 is from 34
- R4C3 region can't grow left or it would crash into region containing R2C1 and we know these are different, hence R4C2 is low
- R4C4 can't be the same region as R4C3 or it would break the sudoku grid so this is low
- R4C3 region needs to get out, but it can't take R5C2 as by sudoku this is not the same digit as R4C3, so R5C2 is low
- R5C2 can't join up with R2C2 or the region would be too large, so R3C2 is high

KILLER SUDOKU

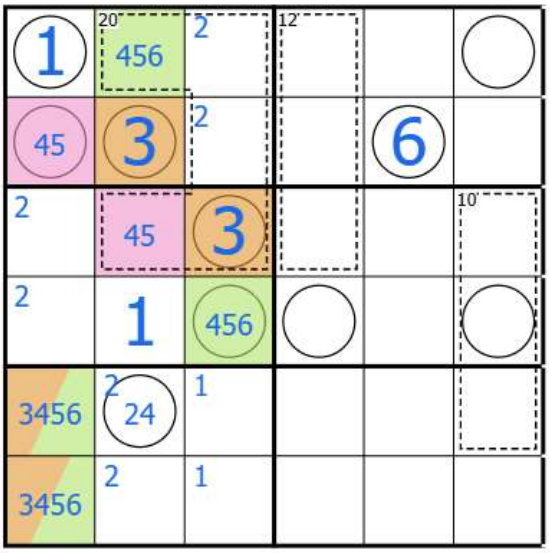


FORTRESS FILLOMINO

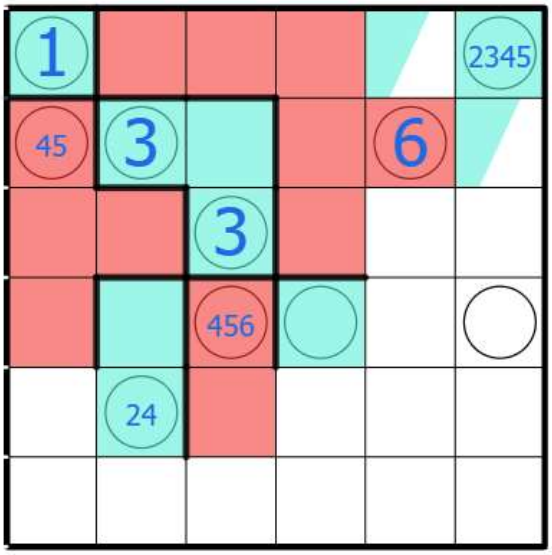


- Can FR2C2 region take R2C4? No. It would need to be shut in by highs on all sides and this would create a size 7 region that contains a circle which would need to be 7, and there's no 7 in 6x6 sudoku
- So FR2C4 is high, shutting in a region of size 3 and placing some 3s
- Can FR1C6 be high? It couldn't connect left or we get another size 7+ region with a circle, but if it goes down it eventually crashes in to R4C6 circle breaking sudoku
- So FR1C6 is low, and not 1 by sudoku so it does escape in some direction
- FR2C5 can't be in the same region as R1C6 by sudoku, so must be high, and a 6

KILLER SUDOKU



FORTRESS FILLOMINO



- Shut in the FR2C5 region with lows on all sides
- Hence FR1C6 is from 35.
- 1 is limited to two spots in SR2

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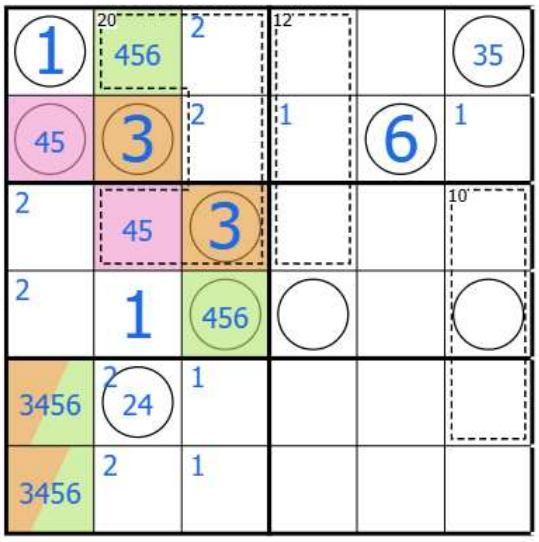

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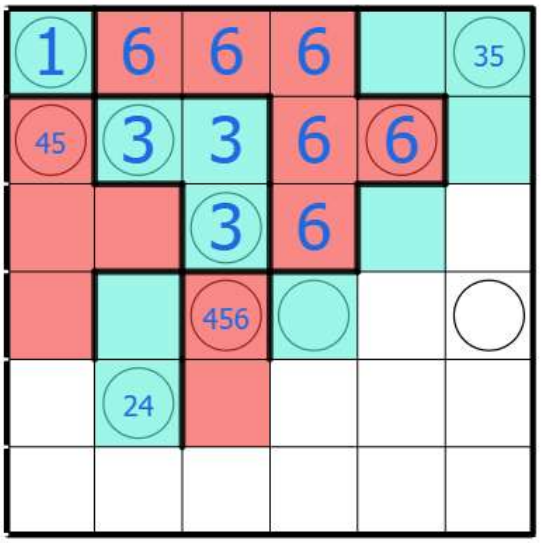
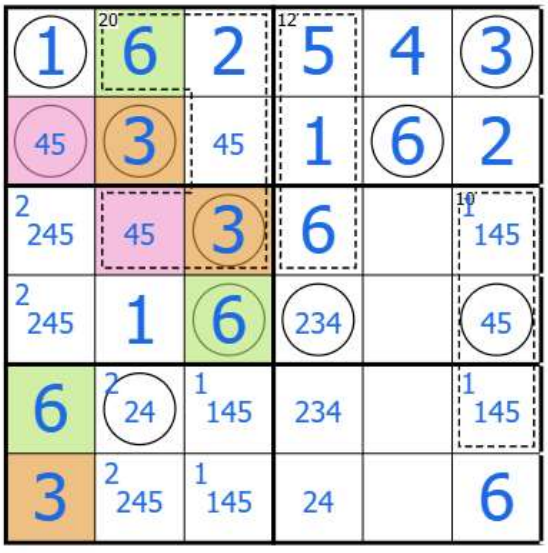


- 10 cage can't be 235 or it breaks R1C6, so must contain a 1
- Places 1 in SR2C4
- 12 cage is 156 and the order is known
- Makes SR1C6 a 3
- FR1C6 must be shut in with a high in FR3C6

KILLER SUDOKU



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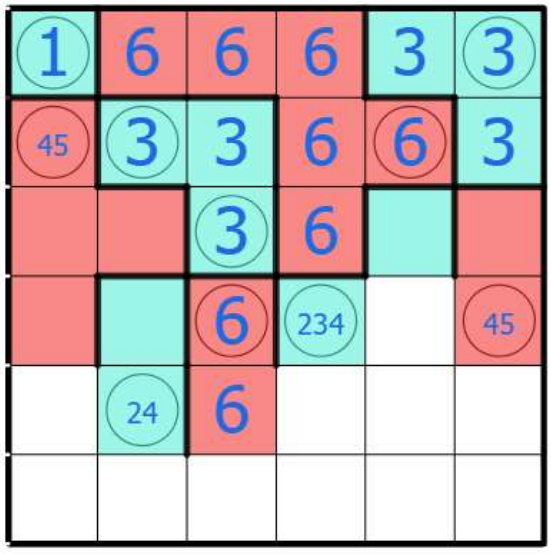

- FR2C1 can't be 4. Shutting in this region with a low in FR5C1 would create two 4 regions touching. So FR2C1 is a 5 and can be completed

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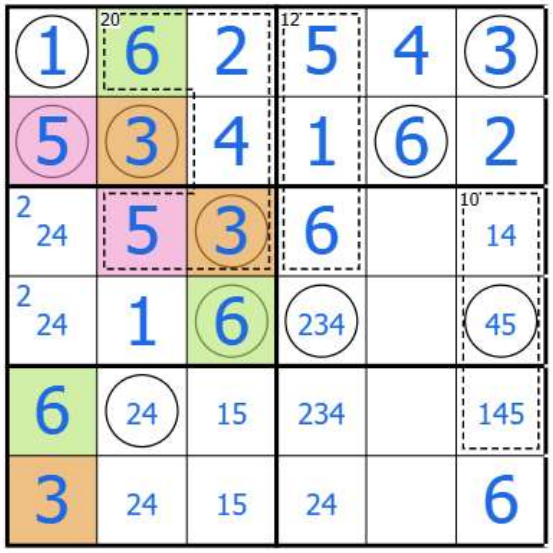

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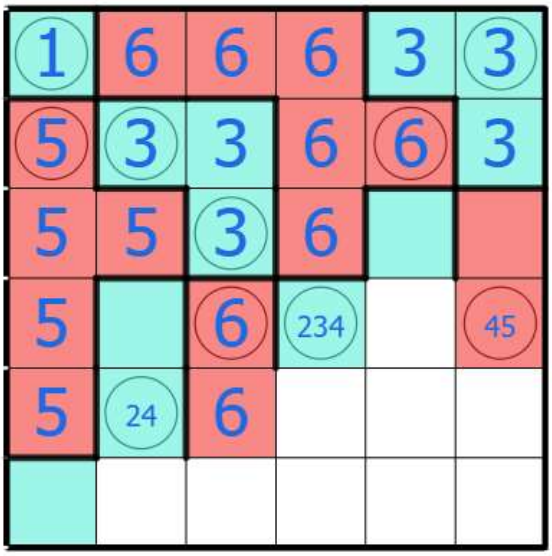

- Making FR5C2 a 4 forces the 6 region right, and then it is not possible to place both the 6 and other high region in the leftover available space
- Hence FR5C2 is a 2, and sudoku follows

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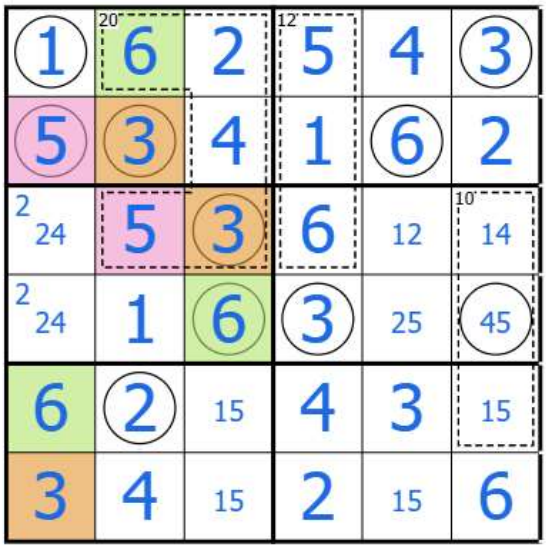

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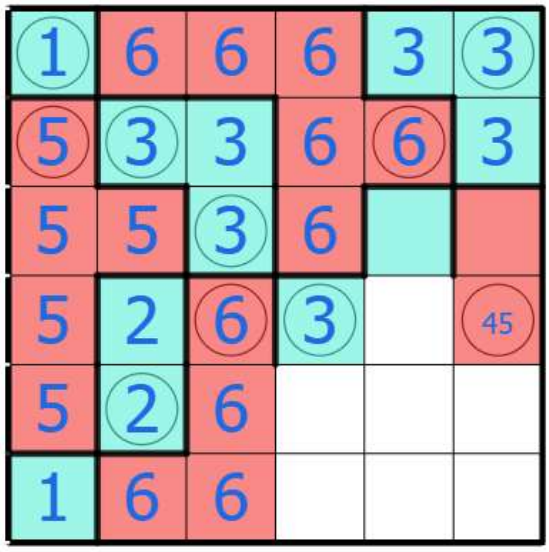

- Making FR4C4 a 4 forces FR4C6 to be a 5, and then there is not enough space to place the 4, 5, and 6 regions without violating fortress fillomino in some capacity
- Hence FR4C4 is a 3
- Connecting FR4C4 to FR3C5 makes it impossible to complete the high regions without violating fortress fillomino
- Hence R4C5 is high
- Regions finish trivially

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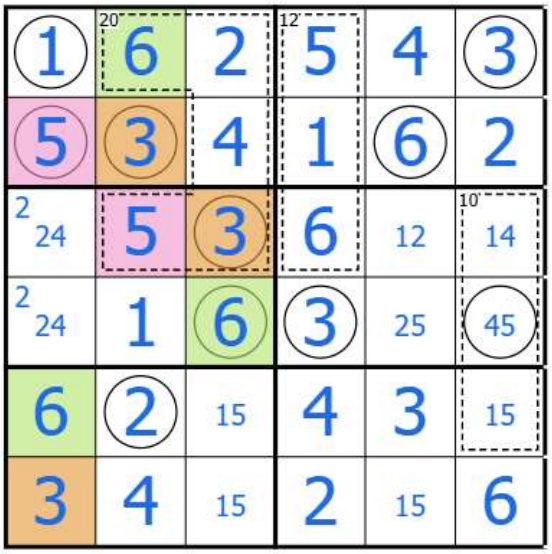

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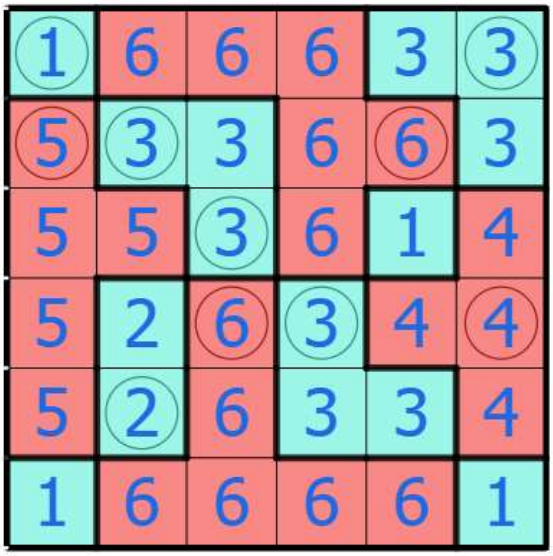

- FR4C6 is a size 4, so making SR4C6 a 4 finishes the sudoku

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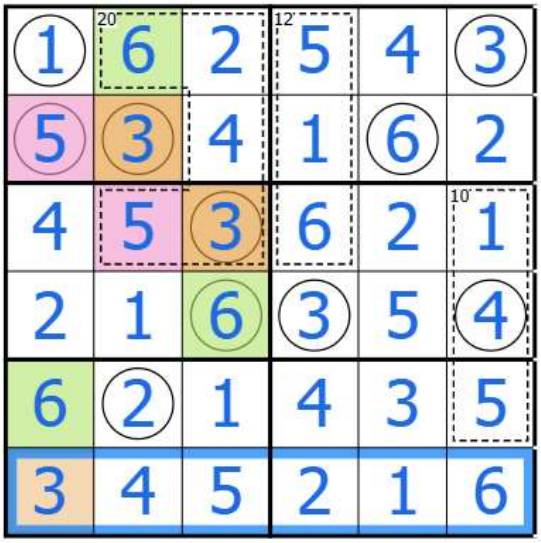

FORTRESS FILLOMINO