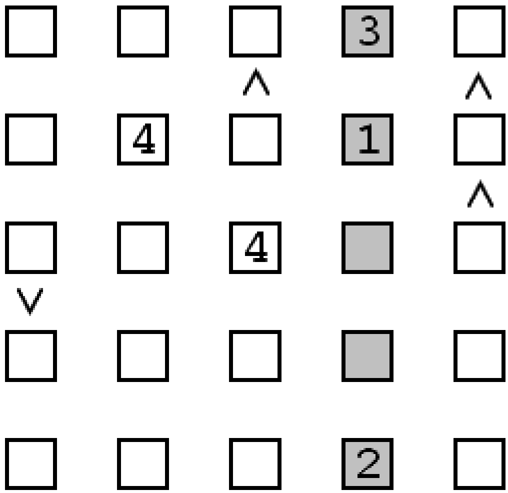
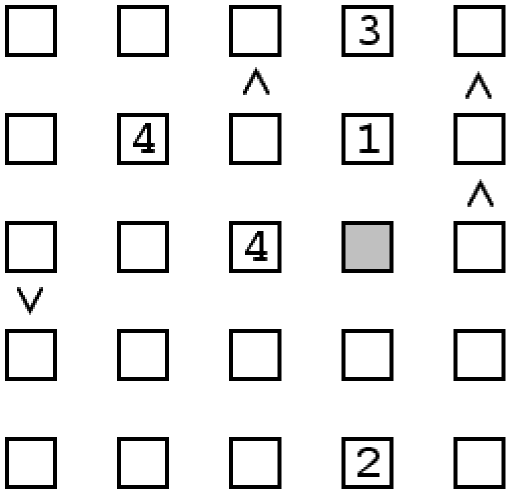
Hidden and naked singles

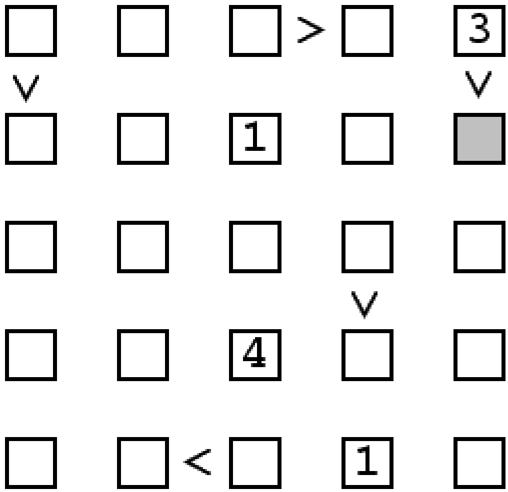


In the above puzzle consider where 4 can go in the shaded column. There is already a 4 in row 3, so 4 must go in row 4 in this column. This is a hidden single.

In futoshiki the inequality signs can also contribute to a hidden single. Consider where 1 can go in row 3 in this puzzle. There is already a 1 in column 4 and two of the remaining three empty cells in row 3 are greater than one of their neighbours, so 1 must go in column 2 in row 3. Usually this trick only works for 1 or 5, but you may encounter puzzles where you can use it to place other candidates!

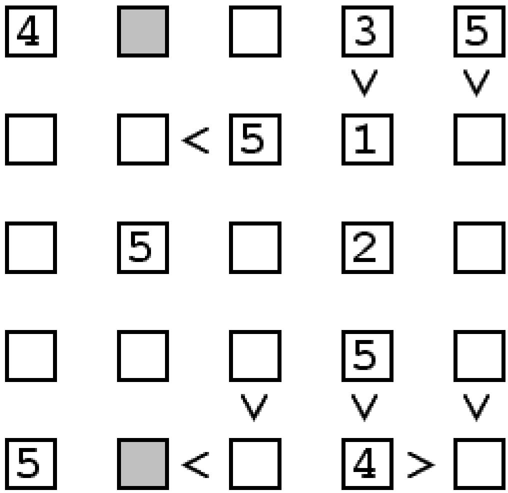


In the same puzzle consider what can go in the shaded cell. There's already a 1, 2 and 3 in the same column and there's a 4 in the same row, so the only possible candidate for this cell is 5. This is a naked single.



Inequality signs can also contribute to naked singles. In the above puzzle the only candidate for the shaded cell is 2, since it must be less that 3, but there is already a 1 in the same row.

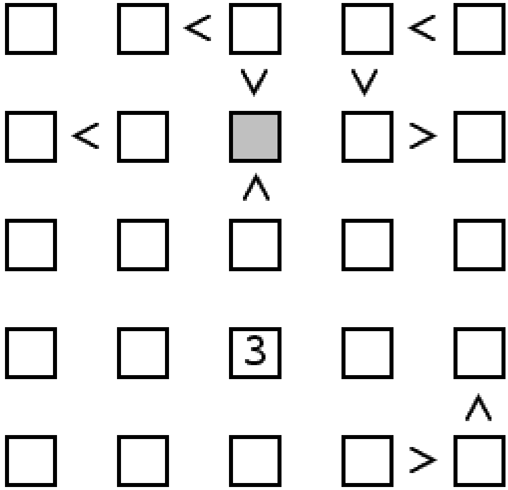
Hidden and naked pairs



In this puzzle you can make no progress using hidden and naked singles. If you look at the second column, the only candidates for the two shaded squares are 1 and 2. So if one of these cells is 1 then the other will be 2, and vice versa. Either way you can eliminate 1 and 2 as candidates for rows 2 and 4 in column 2. As a result 1 is a hidden single in row 4 column 1. This is an example of a naked pair, where two numbers are the only two candidates for two cells in one line.

Another way of looking at this is that 3 is only a candidate in rows 2 and 4 in column 2 and similarly 4 is only a candidate in rows 2 and 4 in column 2. So you can eliminate other candidates from rows 2 and 4 in column 2. This is an example of a hidden pair, where two candidates appear in only two cells in a line.

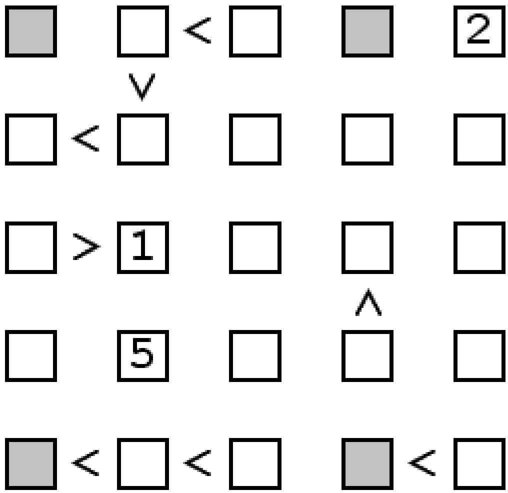
Compound comparisons



Consider the shaded cell in this puzzle. It is smaller than two other cells in the same column. As a result you can eliminate 4 as a candidate from this cell. This is the key to solving this puzzle. Sometimes you'll see a cell that's less than three cells in the same line, then you can eliminate 3 as a candidate from that cell.

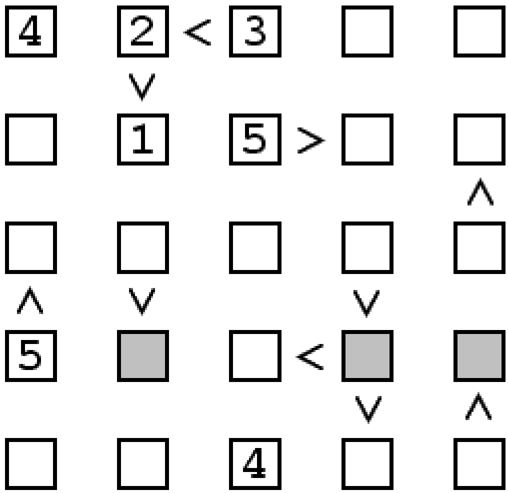
Be careful when using this technique. The cell above the shaded cell is greater than two of its neighbours, so you might think you can eliminate 2 as a candidate from this cell. But each of these neighbours is in a different line. In fact this cell is 2 in the solution to this puzzle!

X-wings



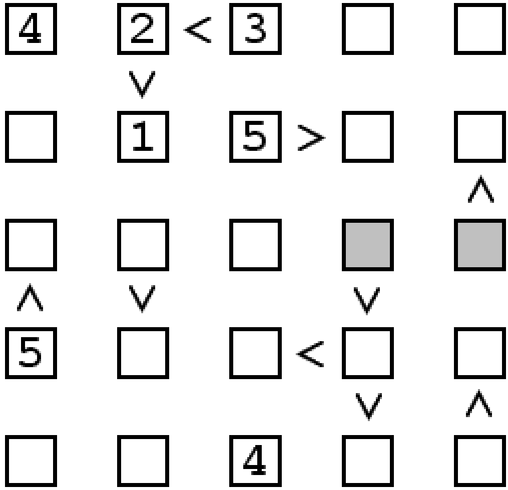
In this puzzle you can only place 1 in one of the two shaded cells in row 1. Similarly you can only place 1 in one of the two shaded cells in row 5. Therefore you can eliminate 1 as a candidate from the other three rows in columns 1 and 4. This is an example of an x-wing, where one candidate appears in only two columns in two rows or vice-versa. When you eliminate 1 from row 2 column 1, the only candidate left for this cell is 2, and the rest of the puzzle is easily solved.

Locked comparisons



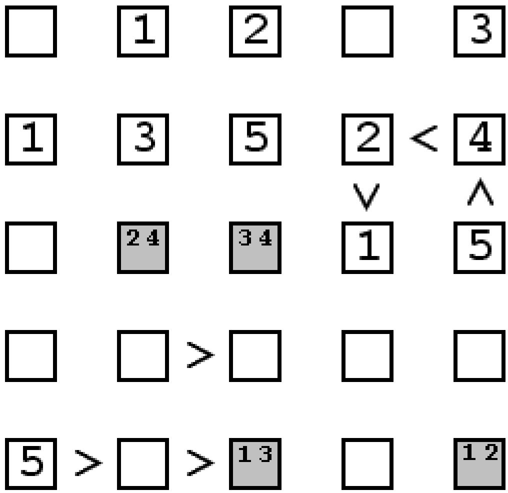
In this puzzle, 4 must go in one of the three shaded cells in row 4. Each of these cells is less than one of its neighbours in another row. As a result one of these neighbouring cells must be 5. The cell at row 3 column 5 shares a row with two of these neighbouring cells and a column with the third one, so you can eliminate 5 as a candidate from this cell. Then the rest of the puzzle is easily solved.

You can also use this technique if every possible cell for 2 in a line is greater than one of its neighbours in another line. In this case you could eliminate 1 from any cell which shares a row or column with all of these neighbouring cells.



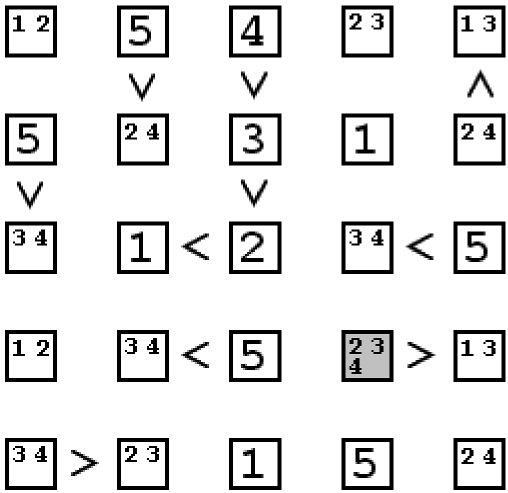
In the same puzzle is an example of this technique using 3. In row 3, the shaded cells are the only places you can put 3. Each of these cells is greater than a neighbouring cell in another row. So one of these cells must be 2 (there's already a 1 in row 2 and you can't place 1 in row 4 column 4 because it's greater than one of its neighbours). As a result you can eliminate 2 as a candidate from row 2 column 4 and row 4 column 5. This example doesn't solve this puzzle, but it's the key for some puzzles.

XY-chains



In this puzzle each of the shaded cells have only two candidates. If the bottom right cell is 1, then the bottom middle cell will be 3, the middle cell will be 4 and its neighbour will be 2. Alternatively the bottom right cell is 2. Either way you can eliminate 2 as a candidate from row 5 column 2. This is an xy-chain. Each cell in the chain has only two candidates and shares a candidate with the next cell in the chain. The ends of the chain also share a candidate and this candidate can be eliminated from any cell which shares a line with both of them. This chain contains four cells, but you can get chains with only three cells and you can also get longer chains.

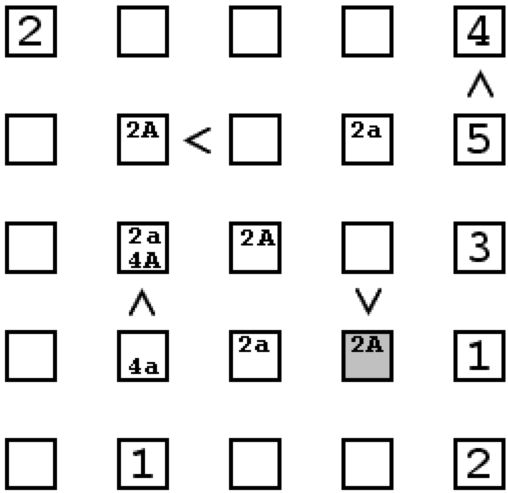
Inferred inequalities



In this puzzle the shaded cell is greater than one of its neighbours. Looking at the remaining candidates for each cell (after using all the previous techniques) you can infer that this cell is also greater than the first cell in this row. So you can apply the compound comparisons technique to eliminate 2 from the shaded cell.

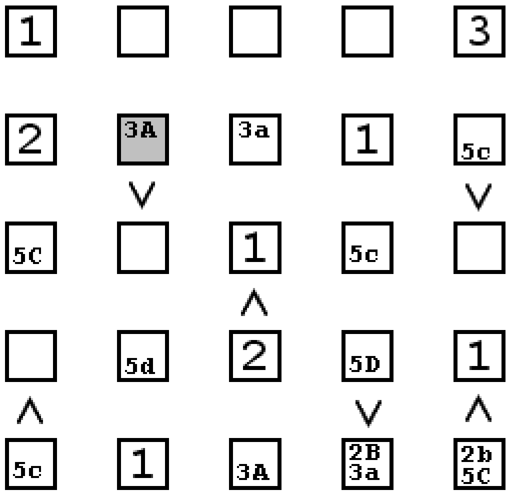
Alternatively note that there is one other cell where you can put 2 in column 4. By looking at the candidates in the cells in row 1 you can infer that this cell is greater than the first cell in row 1. Now you can apply the locked comparisons technique to eliminate 1 from row 4 column 1 and row 1 column 5.

Colours on multiple candidates



In this puzzle there are only two cells for 2 in each of the middle three rows and columns. They have been labelled **2A** or **2a**. Also there are only two candidates in row 3 column 2, so the 4 can be labelled **4A**. As there is only one other cell for 4 in column 2, this candidate is labelled **4a**. Now either all the candidates labelled **A** are true or all the candidates labelled **a** are true. As a result you can eliminate 4 as a candidate from the shaded cell, because there is a 4 labelled **a** in the same row and a 2 labelled **A** in the same cell. This is an example of colours on multiple candidates.

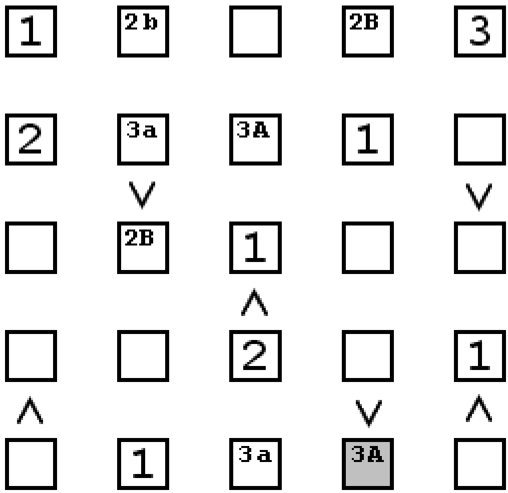
Nice loops on multiple candidates



In this puzzle there are only two places for 3 in rows 2 and 5 and in column 3. These are marked **a** or **A**. In row 5 there are only two places for 2. These are marked **b** or **B**. Note that although a **3a** and a **2B** share the same cell, you cannot mark the 2 with **A** because 4 is also a candidate for this cell. In column 5 there are only two places for 5. These are marked **c** and **C**. Once again 4 is a possible candidate for row 5 column 5 so the 5 in this cell can't be marked **B**. Now you can eliminate 5 as a candidate from the shaded cell. This is because if **3A** is true then this cell is 3. Alternatively **3a** is true. In this case **2B** is false so **2b** is true and if **2b** is true then **5C** is false so **5c** is true. But **5c** shares a row with the shaded cell. This is an example of a nice loop.

There is another nice loop in this puzzle which eliminates 3 as a candidate from row 4 column 2.

Coloured inequalities



In the same puzzle the 3s are marked **a** or **A** as before. Also there are only two places for 2 in column 2 and row 1. These are marked **b** or **B**. Now if the candidates marked **a** are true then row 2 column 2 would be 3. This cell is bigger than row 3 column 2 so this cell would be 2 and the candidates marked **B** would be true. The alternative is that the candidates marked **A** are true. As a result you can eliminate 2 from the shaded cell because it shares a column with a **2B** and a cell with a **3A**. This is an example of a coloured inequality.