

[Main Page - Back](#)

Multivalue X-Wing Strategy

From sudokuwiki.com, the puzzle solver's site

2		
	3	6
5		7

I've named this strategy Multivalue because we're dealing with several candidate values but the formation is exactly as an X-Wing, infact it also follows the generalised x-wing as described above.

Take a look at this rectangular formation made from the yellow and brown cells. Connecting the two yellow cells is a conjugate pair of 6, the only two sixes in the row. In the other row connecting the two brown cells is a conjugate pair of 5. What connects the cells in the columns are the additional candidates, in this case 1 in column 1 and 9 in column 9. Note that there are additional 1's and 9's in these columns. These are the candidates we can eliminate and they are highlighted in green cells.

The logic goes as follows: 6 must occur in one of the two yellow cells and the 5 must occur in one of the brown cells. No doubt about that. But both 6 and 5 cannot occur in the same column. Lets pretend they do, say 6 and 5 in column 1. That would leave 9 as the only solution in two cells in column 9. Can't have that. So whichever way round 6 is 5 will be in the opposite column.

	1	2	3	4	5	6	7	8	9	
A	4	1 7 9	3 7 9	1 9	5 7	6 7 9	2 3 9	8	2 5 6 9	1
B	1 6	1 8 9	5	1 2 3 8 9	2 8	3 9	7	4	6 9	2
C	2	6 8 9	3 7 9	6 8 9	4	5 6 7 9	3 5	3 9	1	3
D	7	2	6	4	9	8	1	5	3	4
E	3	4	8	5	6	1	2 9	7	2 9	5
F	9	5	1	7	3	2	4	6	8	6
G	8	6 9	4	2 3 6 9	1	3 5 9	3 5 9	2 3	7	7
H	1 5	1 7 9	2	8 9	7 8	4	6	1 3 9	5 9	8
I	1 5 6	3	7 9	2 6 9	2 5 7	6 7 9	8	1 2	4	9

Multivalue X-Wing 1: [Load Example](#) or : [From the Start](#)

This forces the 1 and 9 to fill the remaining two corners. If 1 and 9 are guaranteed to be in either a yellow or a brown cell apiece then we can't have any more 1s and 9s in those columns. Hence the eliminations.

Likewise, a 5 or a 3 will appear one of the cells into the bottom box, H7 or A9. That forces 4 to be the solution to that pair - we just don't know which way round yet. The 4 in H8 can go.

	1	2	3	4	5	6	7	8	9
A	7 9	5	8	7 9	4	2 3	1	6	2 3
B	4	1 2 6	1 2 6 9	1 5 6 9	1 2 3 6 9	2 5 6 7	5	2 3 5 7	8
C	1 7	1 2 6 7	3	1 5 6 7 8	1 2 6 8	2 5 6 7 8	9	2 4 5 7	2 4 7
D	5 8	4	2 6 7	3	5 8	9	2 6	2 7	1
E	3	1 2 6 8	1 2 6 9	6 7 8	2 6 8	2 6 7 8	4 6	4 9	5
F	5 7 9	2 6 7	2 6 7 9	4	2 5 6	1	3	8	2 7 9
G	1 8	1 3 8	4	1 5 6 8 9	1 3 6 8 9	5 6 8	7	2 3 5 9	2 9
H	2	1 3 7 8	1 7	1 5 8 9	1 3 8 9	4 5 8	4 5	3 5 9	6
J	6	9	5	2	7	4 3	8	1	4 3

Multivalued X-Wing 2: [Load Example](#) or : [From the Start](#)

Eliminations such as these can be achieved using Nice Loops and other very advanced strategies but this is well worth looking out for separately since its both easier to spot and extends the elegance of the familiar X-Wing.

2		
8		6
		3

	3	6
5		7

Comments...

Thursday 3-Sep-2009

... by: Joseph

Your paragraph that starts "Using the argument.." should say:

"Using the argument above we know that one 5 or 3 will occur in B7 or A9 forcing the other cell in the top right box to be a 2.

You have it listed 5 or 2, but I think it should be 5 or 3, since one of them will be a 2 as you state correctly afterwards. I may be wrong, but that makes the most sense, especially following the logic in the bottom box.

Great site though! I love it-no Sudoku site comes close to being as good as yours!

Andrew Stuart writes:
Fixed ! ty

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Your comment or question

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