

Sue-De-Coq

From sudokuwiki.org, the puzzle solver's site

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This exotic strategy is strongly related to trivial patterns like [Naked Pairs](#) and [Naked Triples](#) since we are identifying **Locked Sets**. The building blocks are [Almost Locked Sets](#) but the most interesting aspect is the alignment of these parts.

To re-cap the terms:

- A **Locked Set** is a group of cells that can see each other which have candidates - an example being a Naked Pair
- An **Almost Locked Set** is a group of cells which are mutually visible and share candidates in some combination.

There is a sequence we can follow:

- An **Almost Almost Locked Set** is a group of cells which are mutually visible and share candidates in some combination.
- An **Almost Almost Almost Locked Set** is a group of cells which are mutually visible and share candidates in some combination.

and so on. Horrible names and often abbreviated AALS, AAALS etc.

Sue-De-Coq, named after the forum handle of the clever chap who identified it, starts with an AALS which must be aligned in a row or column AND be wholly contained within a box. This restricts the size of the AALS group to two or three cells.

In the first example the two yellow cells (N=2) contain {2,3,5,8} which is N+2, or four candidates. The group is contained within box 4. We don't know which of the values {2,3,5,8} will be the solution to **D2** and **E2** but clearly two of those four will be. Now, if we look along the unit of alignment (column 2) and within the box we can find single cells that contain two of those candidates. **B2** contains {2,8} (the green cell) and **F3** contains {3,5}. The AALS can see these cells - which is important!

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

We now know that the solution to the AALS {D2,E2} cannot be 2/8 or 3/5 since it would leave nothing in the cells B2 and F3.

The logic is as follows. If neither {2/8} can fill the AALS nor {3,5} then some other combination must fill it that leaves a digit free for the single bi-value cells. So effectively {2,3,5,8} must fill all coloured cells. Indeed the group in total contains four cells and there are four candidates, so we have identified the total group as a Locked Set. This means we can remove all candidates X that see all X in the total group. This excludes the 8 in C2 and J2 (aligned in the column) and 2 G2 (also aligned in the columns) and the 3 in E3 (shares the box).

The example above was a relatively easy pattern - we found a four cell **Locked Set**. Sue-De-Coq can be used in more complicated patterns like the second example. In the first example we used bi-value single cells as the 'hooks' to make the 4-cell locked sets. Bi-value cells are by definition **Almost Locked Sets** since they contain two candidates in one cell. Sue-De-Coq can use larger ALSs to make the pattern.

In the second example we combine an AAALS (N+3) in {E7,E8} containing {1,3,6,7,8} with two normal ALSs {D9,F9} and {E2} containing {1,3,7} and {6/8} respectively. The trick is that the total number of cells, 5, equals the total number of candidates in all the cells {1,3,6,7,8}. We get a 5-cell Locked Set.

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

Sue-De-Coq Example 2: [Load Example](#) or: [From the Start](#)

To eliminate we look at what candidates OUTSIDE the pattern can see ALL the candidates INSIDE the pattern. These are the 6s and 8s in row E, and the 1s, 3s and 7s in box 6.

Generally then...

The general terms the rule for the pattern is as follows:

- Find a 2-cell or 3-cell group inside a box that is also aligned on a row or column - call it group C
- C contains a set of candidates, V, which must be two or more than the number of cells in C (N+2, N+3 ALS etc).
- We need to find at least one bi-value cell (or larger ALS) in the row or column which only contains candidates from set V, called D
- We need to find at least one bi-value cell (or larger ALS) in the box which only contains candidates from set V, called E

- The candidates in D and E must be different.
- Remove any candidates common to C+D not in the cells covered by C or D in the row or column
- Remove any candidates common to C+E not in the cells covered by C or E in the box

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