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## Strong inferences induced by the UR

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### Author

### Message

#### Myth Jellies

Posted: Fri Jul 24, 2009 11:40 pm Post subject:



Joined: 19 Sep 2005  
Posts: 623

DPB,

Anything you add to a binary cell will add another BUG option, so unless you are starting out with a whole mess of binary cells, it is probably going to get unwieldy pretty fast. The benefit to adding candidates to a solved cell is that it doesn't necessarily add a new BUG option

All in all, it didn't seem very useful, though it was an interesting challenge. Maybe with a different setup it would be more useful.

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#### aran

Posted: Sat Jul 25, 2009 4:06 am Post subject:



Joined: 02 Mar 2007  
Posts: 356

#### RW wrote:

. Jeff says:

*"For any BUG grid that has only one non-BUG candidate, a unique solution can be obtained by placing the remaining non-BUG candidate in the poly-valued cell. It follows that any move that can create a BUG grid with one single non-BUG candidate is a valid move too."*

I don't see why the above "it follows that" should be any more true than this :  
 $x = \dots = y - UR = z : \Rightarrow z$  (which is invalid as everyone knows)  
 in other words making a uniqueness deduction in the course of a chain does not validate that deduction, it merely allows the chain to advance logically on the assumption of uniqueness :  
 if that chain then produces a contradiction, the original premise is false which it seems to me is exactly what RW found.

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RW

Posted: Sat Jul 25, 2009 6:13 am Post subject:



Joined: 16 Mar 2006  
 Posts: 981  
 Location: Finland

**aran wrote:**

if that chain then produces a contradiction, the original premise is false which it seems to me is exactly what RW found.

I would say that I haven't quite yet proved Jeff's premise false. The corollary says: "Any **placement** of a candidate which forces a grid into a BUG+1 is a valid move." I haven't yet found a counterexample with a placement, only with elimination of a candidate. (If the corollary used the word *elimination* instead of *placement*, then it wouldn't be very hard to disprove. According to such a definition a BUG+2 grid would be a paradox that couldn't exist in a valid sudoku.)

To prove the corollary wrong, you must find a grid that satisfies the following:

- A number of solved cells S that make up a valid unique subpuzzle to a valid solution grid G.
- At least one solved cell P that is not part of G.
- All unsolved cells form a BUG+1 grid.

There might be several cells P that aren't part of G, provided all of them can be traced back to one of them (the original placement when applying the corollary has led to solving a few other false cells before reaching the BUG+1 grid). The BUG+1 grid doesn't need to be immediately visible from the solved cells, as long as the candidates in the grid can be reduced to a BUG+1 grid with logical techniques.

If a grid like this exists, then corollary 4 is false.

RW

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