The hardest sudokus (new thread)

POSTREPLY ✉ Search this topic... Search

1330 posts • Page 24 of 89 • 1 ... 12 ... 20 ... 23 24 25 26 27 ... 44 ... 89

Re: The hardest sudokus (new thread)

Posted: Fri Jan 14, 2011 11:54 am

Posted by **lynch** » Sat Jan 12, 2011 11:54 am

I encountered a discussion about an Arto! sudoku creation here by charce here

Zapmeister (a.k.a. 999_Springs) -in his own way- giving his comments 😉

lynch
Posts: 3259
Joined: 28 January 2006
Location: Spain

Re: The hardest sudokus (new thread)

Posted: Sun Jan 12, 2011 12:08 pm

Posted by **m_k_mescaff** » Sat Jan 12, 2011 12:08 pm

> **lynch wrote:**
> I encountered a discussion about an Arto! sudoku creation here by charce here
>
> Zapmeister (a.k.a. 999_Springs) -in his own way- giving his comments 😉

Yes, he's incorrigible. He didn't reply to my most recent e-mail (below).

Regards,

Mike Mescaff

---- Original Message ----
From: [yop]
To: "Arto Inkala" <arto@suzubou.com>
Sent: Monday, July 26, 2010 8:02 AM
Subject: Re: Hard puzzles?

> Dear Arto,
> Thank you for your thoughtful reply. It is widely agreed that rating is a
> difficult problem. That's why there is no commonly accepted methodology, but
> only what people think is to be allowed as a standard. Solving
> Explainer, for all its faults, at least provides a basis for comparison and
> discussion, especially as anyone can download it and use it. Further, in the
> Patterns Game, SE is used to provide each puzzle with a triple rating
> (hardest move/first cell solved/first elimination). This allows us to
> establish that a puzzle rated 10.0:10.0:10.0 is harder than 10.0:9.0:10.0
> even though asserting that it is easier that 10.1:3.2:5.2 might be less
> clear.
>
> In your case, you at least appear to design your own puzzles AND your own
> rating system, and then claim that your puzzles are the world's hardest.
> This is hardly the independent peer review that we are used to in the
> mainstream world. Do you have any independent evidence that your puzzles that
> have long been superseded, Why not take the top dozen from champagne's list?
> This example, an isomorph of my own personal hardest, is from 2006.
>
> 001000200
> 000500050
> 000000007
> 000000000
> 000020000
> 080900000
> 700000006
> 050400030
> 003000100 SD=11.8/11.8/5.4
>
> How does that fare on your rating?
>
> I suggest that you do yourself a disfavour by not publishing your ideas for
> comment. This leads to
> postings such as these:
>
> the-hardest-sudokus-new-thread-t6539-425.html#p218972
>
> has-anyone-ever-tried-solved-the-at-escargot-t3020-15.html
>
> Regards,
>
> Mike Mescaff
>

m_k_mescaff
Posts: 1327
Joined: 10 May 2006
Location: Xenia

Re: The hardest sudokus (new thread)

Posted: Sun Jan 12, 2011 6:46 pm

Posted by **999_Springs** » Sat Jan 12, 2011 6:46 pm

> **lynch wrote:**
> I encountered a discussion about an Arto! sudoku creation here by charce here
>
> Zapmeister (a.k.a. 999_Springs) -in his own way- giving his comments 😉

wow the Internet is a small world

also don't ever play flush flash revolution unless you have too much spare time it's such a time-waster, you should play o ireland

by the way can someone tell me what's been happening in the sudoku world in the last five-hundred years because i haven't been following

999_Springs
Posts: 925
Joined: 17 January 2007
Location: In the Mark, flushing down springs, one by one.

Re: The hardest sudokus (new thread)

Posted: Fri Mar 22, 2013 6:49 pm

Posted by **999_Springs** » Sat Jan 14, 2012 7:08 pm

... wow thanks for completely blanking my necrocomeback post guys

see you all in another five-halves years, and i fully expect to see a 16 or minimal 40 or se 12.0 by then

999_Springs
Posts: 925
Joined: 17 January 2007
Location: In the Mark, flushing down springs, one by one.

Re: The hardest sudokus (new thread)

Posted: Fri Mar 22, 2013 6:49 pm

Posted by **champagne** » Fri Mar 22, 2013 6:49 pm

We are end of March, it was time to produce, as announced the next update of the file of potential hardest, here

I added the file from Mladen Dobrichev I had in hands in January before departure for a 2 months break.
I also added the puzzles found in between in the 25 clues area.

Next month, may be after a new update, I'll study the exotic properties of the new puzzles.

champagne
2011 Supporter
Posts: 7339
Joined: 22 August 2007
Location: France Brittany

Re: The hardest sudokus (new thread)

Posted: Sun Mar 24, 2013 12:49 pm

Posted by **Ulm-Matrix** » Sun Apr 15, 2012 8:04 am

Hi, champagne,

I played around a bit with the multifish pattern and became quite good at manually spotting it. I tried one of your "nothing special" puzzles of the december update with the highest SE rating and found a rank 0 logic with 20 truths:

CODE: SELECT ALL

```
98.7....4.89.....1.4..7..3.9...6...7..2...51.6.8.3.....5.4......2;11:80;11:80;2:80;225000;cc1;2012_11_18;0
```

The way to find it is to look for a set of 4 digits that hardly mix with the non-set digits in rows and columns.

CODE: SELECT ALL

```
+-----+-----+-----+
| ... | ... | ... |
| ... | 1.8 | ... |
| ... | ... | ... |
+-----+-----+-----+
| .7. | ... | .3. |
| ... | ... | ... |
| ... | ... | ... |
+-----+-----+-----+
| ... | ... | ... |
| ... | 5.4 | ... |
| ... | ... | ... |
+-----+-----+-----+
```

In this case the digits 1,2,4 and 5 appear in the rows 3,6,8 and 9 and none of the other 5 digits do.
Now the 5 rows that don't contain 1,2,4,5 on given form build the base set: 4 digits times 5 rows equals 20 truths. Afterwards I try to cover the base candidates columnwise either with column links or cell links, whichever takes less links. Basically the columns that contain digits from the set are covered by column links for the remaining digits and those columns that contain non-set digits as givens are covered by cell links for the empty cells in the base rows. If the number of cell links is less than 9 minus the number of column links, the puzzle is a candidate for the hardest.
In this case the 20 truths are 12/81/240/7 and the 20 links are 45c3, 11c6,12c6, 45c8, 1c57, 2c57, 4c24, 6c1180, 7c1 with 17 eliminations:

r1c57=r5c, r2c2=r1f, r3c8=r2, r3c9=r3, r4c4=r6, r5c1=38, r5c2=39, r5c4=9, r7c4=r9, r8c3=r8, r9c8b=1

Actually, since the 4 truths in row 5 are covered by 4 cell links, you can remove them both from the pattern and get an easier multifish with 16 truths in 124/5/1247 and only 12 eliminations.

Anyway, I believe this puzzle should be moved to the rank 0 only file.

Ulm-Matrix
Posts: 70
Joined: 05 January 2007
Location: Ostermundigen, Switzerland

Re: The hardest sudokus (new thread)

Posted: Sun Mar 24, 2013 12:49 pm

Posted by **Jason Jon Admin** » Mon Apr 16, 2012 2:01 pm

An extensive discussion of puzzles with backdoor size 3 and 4 has been moved to One flew over the backdoors.

Jason Jon Admin
Site Admin
Posts: 97
Joined: 07 April 2010
Location: Dover, Spring, MO, USA

Re: The hardest sudokus (new thread)

Posted: Sun Mar 24, 2013 3:16 pm

Posted by **champagne** » Mon Apr 15, 2013 3:16 pm

> **Ulm-Matrix wrote:**
> Hi, champagne,
>
> I played around a bit with the multifish pattern and became quite good at manually spotting it. I tried one of your "nothing special" puzzles of the december update with the highest SE rating and found a rank 0 logic with 20 truths:
>
> CODE: SELECT ALL
>
> ```
> 98.7....4.89.....1.4..7..3.9...6...7..2...51.6.8.3.....5.4......2;11:80;11:80;2:80;225000;cc1;2012_11_18;0
> ```
>
> The way to find it is to look for a set of 4 digits that hardly mix with the non-set digits in rows and columns.
>
> Anyway, I believe this puzzle should be moved to the rank 0 only file.

champagne
2011 Supporter
Posts: 7339
Joined: 22 August 2007
Location: France Brittany

Re: The hardest sudokus (new thread)

Posted: Sun Mar 24, 2013 3:16 pm

Posted by **champagne** » Mon Apr 15, 2013 3:16 pm

> **Ulm-Matrix wrote:**
> Hi, champagne,
>
> I played around a bit with the multifish pattern and became quite good at manually spotting it. I tried one of your "nothing special" puzzles of the december update with the highest SE rating and found a rank 0 logic with 20 truths:
>
> CODE: SELECT ALL
>
> ```
> 98.7....4.89.....1.4..7..3.9...6...7..2...51.6.8.3.....5.4......2;11:80;11:80;2:80;225000;cc1;2012_11_18;0
> ```
>
> ...
>
> Anyway, I believe this puzzle should be moved to the rank 0 only file.

Sorry Ulm,

I just discovered your post after our admin cleaned the thread.

I'll have three days off, but I'll look at your post and come back end of this week for comments

A better place for such discussions would be here

champagne
2011 Supporter
Posts: 7339
Joined: 22 August 2007
Location: France Brittany

Re: The hardest sudokus (new thread)

Posted: Sun Mar 24, 2013 3:16 pm

Posted by **champagne** » Mon Apr 15, 2013 3:16 pm

> **Ulm-Matrix wrote:**
> Hi, champagne,
>
> I played around a bit with the multifish pattern and became quite good at manually spotting it. I tried one of your "nothing special" puzzles of the december update with the highest SE rating and found a rank 0 logic with 20 truths:
>
> CODE: SELECT ALL
>
> ```
> 98.7....4.89.....1.4..7..3.9...6...7..2...51.6.8.3.....5.4......2;11:80;11:80;2:80;225000;cc1;2012_11_18;0
> ```
>
> ...
>
> Anyway, I believe this puzzle should be moved to the rank 0 only file.

Finally it has not been too long to investigate that situation.

Some free comments

1) Congratulations, as a first post, you entered what was considered one year ago as an extremely difficult field.

2) I agree with you, although I don't spend that much time in manual solving, most of these big rank 0 logic are relatively easy to find for manual solvers.

3) Once you have found the rank 0 logic, you immediately find 7 assignments, and the residual difficulty is around ED 7.5 (serate mode), very far from the original 11.8

4) My solver starts with a 16 truths rank 0 logic (after easy eliminations) in the following position

CODE: SELECT ALL

```
.   .   .   |   .   .   .   |1256 1236 1236|1245 136  1456
.   .   .   |   .   .   .   |1256 1236 1236|1245 136  1456
235 2367 1   |1256 256  4   |  256 9   8   |1256 36789 36789
-------------+--------------+--------------+--------------
.   145  458 |1246 3    .   |1246 8    .   |  268 468  .
.   .    .   |   .   .   .   |   .   .   .   |  .   .    .
148 169  2   |  169 457 8789 |  169 457 8789 |  .   5    .
-------------+--------------+--------------+--------------
1245 9   .   |1246 8    .   |1279 3    .   |  179 574  .
1238 1237 3789 |12389 1237 5   |  189 4    .   |  .   6    .
1458 12457 34578 |12489 1247 12679 |  .   .    .   |  .   .    .
```

16 Truths = {1R124/7 2R124/7 4R124/7 8R124/7 }
16 Links = {1c58 1c58 4c38 9c38 1c57 2c57 4c24 7c24 }
15 elims 6r1c5 6r1c7 8r2c7 7r1c3 8r4c2 9r7c4 4r9c3 5r9c3 1r5c6 2r5c6 1r9c8 2r5c8 4r5c8 5r3c9

So for sure this should be classified as a (pure ?) rank 0 logic.
In my data base, the last updates have not been analysed. That puzzle entered the data base after my last analysis of exotic properties.

I am currently working on another topic. The next update of the data base (in 2 or 3 weeks) should only include new puzzles. An update of exotic properties will come later.

champagne
2011 Supporter
Posts: 7339
Joined: 22 August 2007
Location: France Brittany

Re: The hardest sudokus (new thread)

Posted: Sun Mar 24, 2013 3:31 pm

Posted by **champagne** » Mon Apr 15, 2013 3:31 pm

One more comment on ww's post.

I did not pay attention that ww constructed the rank 0 logic based on the given and not on the PM.

AFAIK it is the first time that somebody did it in that way and I must confess that it is very easy to follow in that case.

I am nearly sure that a process based on that view could replace my current process based on the PM.

In the last step, describing eliminations, the PM still helps.

champagne
2011 Supporter
Posts: 7339
Joined: 22 August 2007
Location: France Brittany

Re: The hardest sudokus (new thread)

Posted: Sun Mar 24, 2013 4:49 pm

Posted by **David P Bird** » Tue Apr 16, 2013 4:49 am

Sws, yes as champagne said, an impressive first post

I use the same way of trying to identify the multifish digits as you.

I then use the trial set as first cover set in one direction and the complementary set as the second set in the other, removing the known digits for each row and column. I'm doing this on spreadsheet and can flip the sets to find which one is more economical.

For this puzzle this produces these option:
Multi-sector Locked Set 28(r1,2)7(r2,3)8(r4,2)89(r5,1)79(r7,1)6(r3,1)2(r6,1)2(r8,1)4(r9) 19 digits/available cells
Multi-sector Locked Set 125(r3,1)16(r1,2)2(r1,2)4(r9,1)8(r1,1)37(r2,2)8(r4,1)57(r5,2)6(r7,2) 19 digits/available cells

Where there is an 5K loop potential I look for 4 givens that match or nearly match this pattern of pairs

CODE: SELECT ALL

```
+-----+-----+-----+
| . . | . . | . . |
| . . | . . | . . |
| . . | . . | . . |
+-----+-----+-----+
| . . | . . | . . |
| . . | . . | . . |
| . . | . . | . . |
+-----+-----+-----+
| . . | . . | . . |
| . . | . . | . . |
| . . | . . | . . |
+-----+-----+-----+
```

I then set these as cover sets for the 4 boxes and the complementary set for the 'unoccupied' rows and columns in the 4 boxes.

```
7.1.6.92.35..9..68....3..8.922.4.8.13...5.7..179:sw:sw#0712231?0000-X;;G13
```

CODE: SELECT ALL

```
+-----+-----+-----+
| . . | . . | . . |
| . . | . . | . . |
| . . | . . | . . |
+-----+-----+-----+
| . . | . . | . . |
| . . | . . | . . |
| . . | . . | . . |
+-----+-----+-----+
| . . | . . | . . |
| . . | . . | . . |
| . . | . . | . . |
+-----+-----+-----+
```

Here is a full blown SK loop with (15) & (37) in boxes 1279 fitting the pattern which gives:

Multi-sector Locked Set 149(r2,8)8(r7,1)49(r1,1)5(r5,1)15(r1,2)7(r2,2)7(r7,2)5(r8,1) 18 digits/available cells

David P Bird
2012 Supporter
Posts: 1543
Joined: 29 September 2006
Location: Middle England

Re: The hardest sudokus (new thread)

Posted: Sun Mar 24, 2013 5:01 pm

Posted by **lupus** » Fri Apr 26, 2013 5:01 pm

Because I used the large collection of very hard puzzles published in this thread, others might be interested in my results.
I scanned all puzzles with my permutation based solver.
All can be solved by assuming candidates TR1E and prove falsification with the following.
Repeatedly apply a sequence of eliminations with max 6 base lines until contradiction.

details see: universal-elimination-pattern

lupus
Posts: 51
Joined: 26 April 2012
Location: Germany

Re: The hardest sudokus (new thread)

Posted: Sun Mar 24, 2013 5:05 pm

Posted by **champagne** » Sun Apr 28, 2013 5:05 am

> **David P Bird wrote:**
> CODE: SELECT ALL
>
> ```
> +-----+-----+-----+
> | . . | . . | . . |
> | . . | . . | . . |
> | . . | . . | . . |
> +-----+-----+-----+
> | . . | . . | . . |
> | . . | . . | . . |
> | . . | . . | . . |
> +-----+-----+-----+
> | . . | . . | . . |
> | . . | . . | . . |
> | . . | . . | . . |
> +-----+-----+-----+
> ```
>
> Here is a full blown SK loop with (15) & (37) in boxes 1279 fitting the pattern which gives:
>
> Multi-sector Locked Set 149(r2,8)8(r7,1)49(r1,1)5(r5,1)15(r1,2)7(r2,2)7(r7,2)5(r8,1) 18 digits/available cells

I can't imagine describing a logic pattern without listing strong inference sets. Am I just overlooking them in your description?

champagne
2011 Supporter
Posts: 7339
Joined: 22 August 2007
Location: France Brittany

Re: The hardest sudokus (new thread)

Posted: Sun Mar 24, 2013 5:05 am

Posted by **David P Bird** » Sun Apr 28, 2013 5:05 am

> **champagne wrote:**
> **David P Bird wrote:**
> When there is an 5K loop potential I look for 4 givens that match or nearly match this pattern of pairs
>
> CODE: SELECT ALL
>
> ```
> +-----+-----+-----+
> | . . | . . | . . |
> | . . | . . | . . |
> | . . | . . | . . |
> +-----+-----+-----+
> | . . | . . | . . |
> | . . | . . | . . |
> | . . | . . | . . |
> +-----+-----+-----+
> | . . | . . | . . |
> | . . | . . | . . |
> | . . | . . | . . |
> +-----+-----+-----+
> ```
>
> I then set these as cover sets for the 4 boxes and the complementary set for the 'unoccupied' rows and columns in the 4 boxes.
>
> ```
> 7.1.6.92.35..9..68....3..8.922.4.8.13...5.7..179:sw:sw#0712231?0000-X;;G13
> ```
>
> CODE: SELECT ALL
>
> ```
> +-----+-----+-----+
> | . . | . . | . . |
> | . . | . . | . . |
> | . . | . . | . . |
> +-----+-----+-----+
> | . . | . . | . . |
> | . . | . . | . . |
> | . . | . . | . . |
> +-----+-----+-----+
> | . . | . . | . . |
> | . . | . . | . . |
> | . . | . . | . . |
> +-----+-----+-----+
> ```
>
> Here is a full blown SK loop with (15) & (37) in boxes 1279 fitting the pattern which gives:
>
> Multi-sector Locked Set 149(r2,8)8(r7,1)49(r1,1)5(r5,1)15(r1,2)7(r2,2)7(r7,2)5(r8,1) 18 digits/available cells

Hi David,

For sure, a "V" loop pattern (most often a SK loop) can also be seen on the given.

I am wondering, looking at your example whether it's not as easy to apply the full definition.

To have a "V" loop you need

CODE: SELECT ALL

```
It a rectangle in four boxes with four corners given and empty cells in the row columns
  (r1c2 r1c9 r9c2 r9c9 8r1c5 8r9c5 4r7c5 2r7c5)
  Each pair of cells in the rows columns of the rectangle sees 5 given exactly
    r1c12 sees 78& 2&
    r1c89 sees 2&
    r9c12 sees 2&
```

IMO this is a necessary and sufficient condition to have a "V" loop.

David P Bird
2012 Supporter
Posts: 1543
Joined: 29 September 2006
Location: Middle England

Re: The hardest sudokus (new thread)

Posted: Sun Mar 24, 2013 5:05 am

Posted by **David P Bird** » Sun Apr 28, 2013 5:05 am

The view I take on multi-sector locked sets isn't based on thinking in terms of base & cover or truth & link sets, although they can be used to confirm the results. Instead I'm looking for a balance in the sizes of a set of candidates and a set of cells.

Let A1 be the resident candidates of interest in the various houses, the cells that are available for containing them are coloured in two colours by my spreadsheet: green when they are constrained to holding only residents, and orange when they can hold either residents or non-residents

Let
R = total number of selected resident candidates
A = total number of available cells (green + orange)
C = total number of constrained cells (green)

If R < C then a naked locked set has been found
If R > A then a hidden locked set has been found

Depending on the result, either the resident candidates or the available cells can be considered to be the base set.

When a difference of one exists in either of these balances the potential eliminations can be examined to see if any external inferences can be employed to identify if some of them to be made - those that will apply regardless of whether the set becomes locked or not.

This works provided that no candidate in the pattern cells is counted as being resident in two different houses (an endo-fin situation).

This colouring tool can also be used to identify doubly linked ALSs and AHSs as < this post >

Champagne, it's because I'm looking for the opportunities provided by near misses that I don't use the full pattern when deciding what's worth exploring.