

The hardest sudokus (new thread)

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Re: The hardest sudokus (new thread)

🗓 By mith • Mon Sep 13, 2021 5:00 pm

“ mith wrote:

“ 999_Springs wrote:

“ mith wrote:

CODE: SELECT ALL

33c

.....1.....23.....24.....5.67..4.8.3.2.86...84..7.6.3.76.38...28.74.3.64.3...2.7.. ED=11.3/1.2/1.2

this starts with 4 hidden singles so when you fill them in you break Mauricio's 14 year old record from January 2007 for the hardest puzzle with 37 clues, which was his symmetric 11.2. nice!

Yeah, I need to run my singles expander on all these hard puzzles, I've probably broken some more of the most-clues-for-given-ER by now.

mith

Posts: 862
Joined: 14 July 2020

Re: The hardest sudokus (new thread)

🗓 By creint • Thu Sep 16, 2021 7:10 pm

Having the hardest database ph_2010 recreated with another minilex:
<http://forum.enjaysudoku.com/minilex-routine-139261.html>

Scanning the Tarek Pearly 6000
<http://forum.enjaysudoku.com/6000-pearls-boom-goes-the-dynamite-139358.html>

And filtering the hardest ones out: 5204
Checking if it is in database: 4357 not in database?
Example 1 (SE 10.5 using Sukaku Explainer): 2.....1.4.7...3...9...5..6.58.....364.....72.8.5.....2...7...3.4...1.....9

Following probably belong in hardest:
<https://pastebin.com/6U91pIMm>

Or are there any mistakes?

creint

Posts: 344
Joined: 20 January 2018

Re: The hardest sudokus (new thread)

🗓 By 1to9only • Thu Sep 16, 2021 9:13 pm

“ creint wrote:

And filtering the hardest ones out: 5204
Checking if it is in database: 4357 not in database?
Example 1 (SE 10.5 using Sukaku Explainer): 2.....1.4.7...3...9...5..6.58.....364.....72.8.5.....2...7...3.4...1.....9

<http://forum.enjaysudoku.com/post211015.html#p211015>

“ champagne wrote:

I'll process your entire file of "hardest" to put them in my data base (and check as well the tarek pearly 6000 file) to avoid redundancy as much as possible

<http://forum.enjaysudoku.com/post265425.html#p265425>

“ champagne wrote:

For the 10.6 10.7, my filter would have skipped them (not pear)

It appears Tarek's Pearly6000 are already accounted for, and sudokus must be at least a 10.6 pearl to make it on the list (to keep it's size manageable).

1to9only

Posts: 4075
Joined: 04 April 2018

Re: The hardest sudokus (new thread)

🗓 By denis_berthier • Fri Sep 24, 2021 5:26 am

AFAIK, the last public release of the hardest collection is ph2010
It seems more puzzles have been found since then. Does anyone have an up-to-date version (I'm only interested in the upper end (≥ 11.7)?

denis_berthier

2010 Supporter

Posts: 3334
Joined: 19 June 2007
Location: Paris

Re: The hardest sudokus (new thread)

🗓 By mith • Fri Sep 24, 2021 9:42 pm

I'll plan to publish an update soonish (by the end of the month, hopefully).

mith

Posts: 862
Joined: 14 July 2020

Re: The hardest sudokus (new thread)

🗓 By Hajime • Sat Sep 25, 2021 2:39 pm

“ creint wrote:

My solver can now solve all the hardest puzzles.
Forcing nets inside forcing nets is the maximum that is required to solve them.

CODE: SELECT ALL

98.7.....7.....6.....6.5.....4...5.3...79..5.....2...1..85..9.....1...4.....3.2..

Takes 8 seconds, but this last steps it only take the first found.

Is your implementation a 2 deep T&E ?

“ creint wrote:

place a -> placements+exclusions. Take this as new pencil mark grid and solve, if contradiction then a is invalid.
If you call forcing net 1 deep T&E then yes.
An easy/slower implementation but it can use all the logic.

Hajime

Posts: 1022
Joined: 20 April 2018
Location: Netherlands

Posts are from March 18.19 2021, so some time ago. But my Nested Forcing Nets search can not solve all puzzles. What I do:

Consider cell A holds candidates. Forcing NET (1 deep)
First placing: place A some candidate -> placements+exclusions.
Take this as new pencil mark grid and solve, if contradiction then A is invalid. OK.

Consider cell A and cell B hold candidates. Nested Forcing NET (2 deep)
..First placing: place A some candidate -> placements+exclusions.
..Take this as new pencil mark grid and solve, if NOT contradiction then try B
....Second placing: place B some candidate -> placements+exclusions.
.....Take this as new pencil mark grid and solve, if contradiction then A can be invalid OR B can be invalid(or both)

.....What to do?

What I implemented: If ALL candidates B lead to contradiction then A must be invalid.

Where can I improve?

Re: The hardest sudokus (new thread)

🗓 By m_b_metcalf • Sun Sep 26, 2021 3:31 pm

CODE: SELECT ALL

1 2
. 3 . 4 . . . 5 .
. 6 . . . 7 . .
. 8 . 9 . 3 . . .
. . . . 1
. . . 5 . . . 4 . .
. . 7 . . 6 . .
. 9 . . . 8 . 3
2 1
1.....2.3.4...5...6...7...8.9.3.....1.....5...4...7...6...9...8.3.2.....1 ED=11.6/11.6/3.4

Mike

m_b_metcalf

2017 Supporter

Posts: 13227
Joined: 15 May 2006
Location: Berlin

Re: The hardest sudokus (new thread)

🗓 By mith • Sun Sep 26, 2021 5:22 pm

This appears to be a morph of the following?

CODE: SELECT ALL

5.....9.2.1...7...8...3...4...2.....5.....7.6.1...3...8...6...4.2.9.....5 StrmCkr 11.6 11.6 3.4

mith

Posts: 862
Joined: 14 July 2020

Re: The hardest sudokus (new thread)

🗓 By m_b_metcalf • Sun Sep 26, 2021 5:32 pm

“ mith wrote:

This appears to be a morph of the following?

CODE: SELECT ALL

5.....9.2.1...7...8...3...4...2.....5.....7.6.1...3...8...6...4.2.9.....5 StrmCkr 11.6 11.6 3.4

Indeed, it is 🙄

M

m_b_metcalf

2017 Supporter

Posts: 13227
Joined: 15 May 2006
Location: Berlin

Re: The hardest sudokus (new thread)

🗓 By creint • Mon Sep 27, 2021 4:05 pm

“ Hajime wrote:

Consider cell A and cell B hold candidates. Nested Forcing NET (2 deep)
..First placing: place A some candidate -> placements+exclusions.
..Take this as new pencil mark grid and solve, if NOT contradiction then try B
....Second placing: place B some candidate -> placements+exclusions.
.....Take this as new pencil mark grid and solve, if contradiction then A can be invalid OR B can be invalid(or both)

.....What to do?

What I implemented: If ALL candidates B lead to contradiction then A must be invalid.

Where can I improve?

A contradiction results in an exclusion in the previous layer.
Keep doing those exclusions until you can't find anything. Just like normal solving. And then go back to previous layer.

Current-> try A. solve -> try B. solve, (if contradiction remove B from A)
For each A you must try each pencilmark for B every time you find a B with contradiction.
If A gives a contradiction you can finally remove this from current puzzle.

You can also look at an explanation in SukakuExplainer.

creint

Posts: 344
Joined: 20 January 2018

Re: The hardest sudokus (new thread)

🗓 By hendrik_monard • Mon Sep 27, 2021 8:21 pm

The following list contains some new 11.6 to 11.8 (new with regard to database ph_2010) that I found.
The 11.8 was already posted by me in this thread on april 19th 2021.

98.7...6..5.8...4...3.7.9.5...3...4...2.1.6...1.2.9.....89.6..11.8/1.2/1.2
98.7...6...8...5.4...3.8.9...7...86...4...2.9.6.3...1.5.....2.1 11.7/11.7/8.0
98.7...6..85...4.3...9.8.7.....2.1.....2.5.7.6...9.5...1...43 11.7/1.2/1.2
98.7..6.5.69...4...8.3...56.2...8.4...2..97.....3.7.....2.31 11.7/11.7/2.6
98.76.5.54.....75.4.9.7.4.9.5.9...5.3...2...4.....81.7.9.8.4..... 11.6/1.2/1.2
98.76.5.75.....4..5.978.....3.4...9.58.....24...8.7.9.2.38....9.1.. 11.6/1.2/1.2
98.7...7.6.5.....4.3...2.5...4...9...82...2...1.7.1...2....63.....19 11.6/11.6/2.6
98.7...6..85...4.3...9.8.6...2.....32.5.6.7.....85.....1.24 11.6/1.2/1.2
98.7..6.5...9.84.....46.7.8...86...3.5.4...4...79...2...8...8.1 11.6/1.2/1.2
98.7.6.5...9.4...8...46.7.8...86...3.5.4...4...79...2...8...8.1 11.6/1.2/1.2
98.7..6...7.5.98.....76.9..5.4.....37.5.6.8..2..7.6...715.. 11.6/1.2/1.2
98.76...5...49...3...4...5.9.7...5.5.2.41...9.2.6.8.....3...1. 11.6/11.6/2.6
98.76...5...7.....5.987...4...9...83.32...3...9.57.5.7.3...1.. 11.6/1.2/1.2
98.76.5.54...7...5...848.9...7.7.5.....32.9.4...75...1.2..... 11.6/1.2/1.2
98.76...54...7...5...848.9...57.7.5.....32.9.4...75...1.2..... 11.6/1.2/1.2
98.7..6.5.46.....9.837.9.5.....2.7...6.4.1...9.7.5.671...1...5 11.6/1.2/1.2

As an updated list of hardest sudokus is being prepared by Mith, I also wanted to let you now that I found some non minimal sudokus in ph_2010. IMO no non minimals should be present in the database of hardest sudokus, possibly with the exception of Mauricio's famous non minimal (for historical reasons?).
For the following list, I used the index numbers as reference.

Non minimals already present in ph_1910 (only tested for ratings >= 11.2):
2236461
561
2112556
2112551
1764 (Mauricio's non-min 95108)

New non minimals in ph_2010 (for all ratings):
3269155 (2 individually redundant clues)
3269199
3269153
3269198
3269154
3269197
3269196
3267874
3261514

The resulting sudokus after removal of redundant clues were already in the database.

Best regards,
Hendrik

hendrik_monard

Posts: 50
Joined: 19 April 2021
Location: Leuven (Louvain) Belgium

Re: The hardest sudokus (new thread)

🗓 By mith • Mon Sep 27, 2021 11:45 pm

Thanks, I had already added your 11.8 to my database, will add the others as well.

I don't really have any experience with the pattern game, but I'll see if I can figure out a good way to scrape those results.

As for the non-minimal puzzles, an early version of the scripts I use was missing a check for minimals; that shouldn't be an issue now, but I will see about running a search to eliminate mine from my copy of the database. I'm not planning to touch anything earlier than that, and the format is going to be different from champagne's anyway - at least for this release, I will probably only do an update of new puzzles, not repost the full database.

I may also provide a second set of puzzles which have not yet been SER rated but have a high skfr; my database currently has about 370k new (since ph2010) puzzles with SER 11+ ratings, but that number jumps to 1.2 million if including skfr 11+ puzzles - and it's quite possible there are some 11.6+ puzzles in that batch, since I've seen a few skfr 11.1s rate much higher on SER. (I have a script running to rate all of these - a few seconds per puzzle usually on the new machine - but it's going to take a while to catch up just from the sheer number generated.) I also need to decide where the threshold will be for new puzzles and whether to make that variable based on clue count - I think the 10.X puzzles in the 19c and 35c+ groups are worth publishing, for example, but maybe I limit the main release to 11+ ratings and do those separately as well.

mith

Posts: 862
Joined: 14 July 2020

Re: The hardest sudokus (new thread)

🗓 By hendrik_monard • Tue Sep 28, 2021 8:11 am

Hi Mith,

When you write "a few seconds per puzzle usually on the new machine ", is that for SER with format 11.7/11.7/2.8 ? On my laptop, it takes typically between 10 and 20 minutes per puzzle with SER >= 11.2
Do you have access to a supercomputer?

Hendrik

hendrik_monard

Posts: 50
Joined: 19 April 2021
Location: Leuven (Louvain) Belgium

Re: The hardest sudokus (new thread)

🗓 By 1to9only • Tue Sep 28, 2021 8:45 am

“ hendrik_monard wrote:

When you write "a few seconds per puzzle usually on the new machine ", is that for SER with format 11.7/11.7/2.8 ?

I think this refers to champagne's skfr, see: <http://forum.enjaysudoku.com/projects-skfr-fast-rating-and-sudoku-multi-purpose-program-t30132.html>
For the Windows binaries (very old v2_0_1), goto: <https://code.google.com/archive/p/skfr-sudoku-fast-rating/downloads>
skfr rates a lot faster than SE, but skfr ratings can sometimes differ from SE ratings.

“ hendrik_monard wrote:

On my laptop, it takes typically between 10 and 20 minutes per puzzle with SER >= 11.2

I posted a faster version of SE (to rate puzzles for the Patterns Game), see here: <http://forum.enjaysudoku.com/pgexplainer-a-minimal-sudokuexplainer-in-56-712-bytes-t39048.html>

1to9only

Posts: 4075
Joined: 04 April 2018

Re: The hardest sudokus (new thread)

🗓 By 1to9only • Tue Sep 28, 2021 9:24 am

Hi 1to9only,

Thanks for the information. I already had skfr operating on my laptop for first indications of 'hardness'.
I'll have a look at your link to the faster SE-rater though. Hope I can integrate it in my VBA script as well.

Hendrik

hendrik_monard

Posts: 50
Joined: 19 April 2021
Location: Leuven (Louvain) Belgium

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