

The hardest sudokus (new thread)

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Re: The hardest sudokus (new thread)

by mith » Wed Dec 29, 2021 10:34 pm

Yes, I fixed a bug at some point that had resulted in a few duplicates, and I haven't gone back to remove them yet. Now that I'm able to get back up to the office regularly I'll find time to update some things like that and get a full database dump together.

QUOTE

mith

Posts: 862
Joined: 14 July 2020

Re: The hardest sudokus (new thread)

by mith » Wed Dec 29, 2021 10:35 pm

Oh, and first minimal 31c 11.6 pearl:

CODE: SELECT ALL

.....1.....2..3..2....4..25.46....7..82.6..8.65.7....54.68.7.28.7.4..66.725....ED=11.6/11.6/2.6

QUOTE

mith

Posts: 862
Joined: 14 July 2020

Re: The hardest sudokus (new thread)

by denis_berthier » Thu Dec 30, 2021 4:34 am

mith wrote:

Here's the output of my search on Hendrik's puzzles:
First set of ratings is SE, second set is skfr; at the moment I'm mostly running SE on 11.3+ skfr (the number of 11+ skfr puzzles I haven't rated yet is absurd). It's interesting how many hadn't been found at all; I'm guessing the first filter (gsf's q2) is skipping them (edit: checked the first two, and yes, they are unusually low q2 for such high SE puzzles).
That gap from 11.0 skfr to 11.7 SE is as big as I've seen, I think.

QUOTE

denis_berthier

2010 Supporter
Posts: 3334
Joined: 19 June 2007
Location: Paris

Interesting. To me, it shows two things:
- changing from SER to skfr (or any other variant of SER) would be absurd (each is as arbitrary as the other); with SER being the de facto standard, that would amount to destroying the only reference common to everyone;
- the q2 (based on the whole path) is an inconsistent measure of complexity (well, that's nor a discovery; I've often observed it); its definition (adding the complexities of each step) is intrinsically absurd.

BTW, congrats to Hedrick for all these new puzzles.

Re: The hardest sudokus (new thread)

by denis_berthier » Thu Dec 30, 2021 4:36 am

mith wrote:

Denis/Hendrik, I use the minlex from gsf: <http://gsf.cococlyde.org/download/sudoku>

QUOTE

denis_berthier

2010 Supporter
Posts: 3334
Joined: 19 June 2007
Location: Paris

Thanks, but could you be more precise? There are several programs there (some only in exe form). Which exactly do you use, and what command line do you use?

Re: The hardest sudokus (new thread)

by mith » Thu Dec 30, 2021 2:26 pm

I use sudoku-linux.i386-64. Complete documentation is in sudoku.html (download tab, sudoku will take you to google drive).

Command for minlex is ./sudoku-linux.i386-64 -f"%mc" [puzzle or input file]

It uses 0 for blanks, I use sed to convert to . format.

QUOTE

mith

Posts: 862
Joined: 14 July 2020

Re: The hardest sudokus (new thread)

by hendrik_monard » Thu Dec 30, 2021 4:43 pm

mith wrote:

Here's the output of my search on Hendrik's puzzles:

Hidden Text: Show

QUOTE

hendrik_monard

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

Hi mith

Thanks for having analysed so transparently my input. At first I was surprised that 64 puzzles were rejected and so I examined my procedures to avoid proposing duplicates in the future. However, I found out that None of the puzzles you identified as duplicates, figured in your November 3th list. So I acted in good faith when I submitted them.

Nevertheless, I can accept your conclusions and shall remove these puzzles from my local list.

Hendrik

Re: The hardest sudokus (new thread)

by mith » Fri Dec 31, 2021 12:31 am

Oh, no need to remove them, I was just checking against my local copy out of curiosity. I figured I'd just credit both of us in the database for those that I had rated, and just you for the others.

QUOTE

mith

Posts: 862
Joined: 14 July 2020

Re: The hardest sudokus (new thread)

by hendrik_monard » Fri Dec 31, 2021 7:02 am

That looks OK for me. Would you also proceed in that way for my puzzles you listed in your post of Oct 6th 2021?

QUOTE

hendrik_monard

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

Re: The hardest sudokus (new thread)

by hendrik_monard » Sat Jan 01, 2022 7:44 pm

mith wrote:

Here's the output of my search on Hendrik's puzzles:

First set of ratings is SE, second set is skfr; at the moment I'm mostly running SE on 11.3+ skfr (the number of 11+ skfr puzzles I haven't rated yet is absurd). It's interesting how many hadn't been found at all; I'm guessing the first filter (gsf's q2) is skipping them (edit: checked the first two, and yes, they are unusually low q2 for such high SE puzzles).

That gap from 11.0 skfr to 11.7 SE is as big as I've seen, I think.

QUOTE

hendrik_monard

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

I was also surprised by the large difference in rating between SER 11.7 and skfr 11.0

So I checked my earlier results and found that the skfr had rated this puzzle as 11.5

I have repeated the skfr for both puzzles and this was the result:

.....1.....23.....2.4.....5.....62..7.6.18..8....7.5.568...2721....6..7.8...5..ED=11.0/1.2/1.2
98.76.5..7.5.....64..9...6.84.7....7..56.4..5.98....9.....8...5.....3.2ED=11.5/1.2/1.2

Quite different for essentially the same puzzle. But the gap between 11.5 and 11.7 for the canonical form is substantially lower than for the minlex form.

To be sure that both puzzles are isomorphs of one another, I submitted the pair to my equivalence/relationship checker and here is the report.

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The detail in the report may seem excessive, but I normally use this tool for examining relations between non equivalent puzzles.

What surprises me the most is that the output of skfr is dependent on which morph you use. In this case the canonical form leads to an skfr result that is considerably closer to the SER result. Could this be systematic? Has someone studied this phenomenon in the past?

Re: The hardest sudokus (new thread)

by yzhwsl » Sat Jan 01, 2022 8:43 pm

hendrik_monard wrote:

.....1.....23.....2.4.....5.....62..7.6.18..8....7.5.568...2721....6..7.8...5..ED=11.0/1.2/1.2
98.76.5..7.5.....64..9...6.84.7....7..56.4..5.98....9.....8...5.....3.2ED=11.5/1.2/1.2

QUOTE

yzhwsl

Posts: 592
Joined: 16 April 2019

Two puzzles were rated 11.5 using the DLL version of skfr in my solver.

Re: The hardest sudokus (new thread)

by StrmCkr » Sat Jan 01, 2022 10:32 pm

Could this be systematic? Has someone studied this phenomenon in the past?

Check the solution chain lengths at Its max difficult step morphing puzzels can increase or decrease chain length which changers the difficulty rating.

Or sometimes a morph can remove a uniqueness arguments construct to aform not covered in cases annalasis leading to. Higher rating or uncover one by the change lowering the result

Is this known: yes, extensive investigated not to my knowledge or at least it's not publisized.

Some do, some teach, the rest look it up.

QUOTE

StrmCkr

Posts: 1297
Joined: 05 September 2006

Re: The hardest sudokus (new thread)

by mith » Sun Jan 02, 2022 3:48 am

Uniqueness could definitely cause a difference. That can happen with SE as well, but for hard puzzles I've never seen such a swing with morphs of the same puzzle. Maybe 0.1 or 0.2.

QUOTE

mith

Posts: 862
Joined: 14 July 2020

Re: The hardest sudokus (new thread)

by mith » Sun Jan 02, 2022 3:49 am

hendrik_monard wrote:

That looks OK for me. Would you also proceed in that way for my puzzles you listed in your post of Oct 6th 2021?

QUOTE

mith

Posts: 862
Joined: 14 July 2020

I think I already added those and they should be in the Nov 3 file, but I can check again when I get home. I was sent some 11s by jovi as well that I need to add.

Re: The hardest sudokus (new thread)

by denis_berthier » Sun Jan 02, 2022 4:20 am

hendrik_monard wrote:

I was also surprised by the large difference in rating between SER 11.7 and skfr 11.0
So I checked my earlier results and found that the skfr had rated this puzzle as 11.5
I have repeated the skfr for both puzzles and this was the result:
.....1.....23.....2.4.....5.....62..7.6.18..8....7.5.568...2721....6..7.8...5..ED=11.0/1.2/1.2
98.76.5..7.5.....64..9...6.84.7....7..56.4..5.98....9.....8...5.....3.2ED=11.5/1.2/1.2
Quite different for essentially the same puzzle. But the gap between 11.5 and 11.7 for the canonical form is substantially lower than for the minlex form.

QUOTE

denis_berthier

2010 Supporter
Posts: 3334
Joined: 19 June 2007
Location: Paris

The fact that SER is not stable under isomorphisms has been known for very long. That this is true for skfr should not be a surprise, as it is a mere re-writing of SER, with no original idea.

As has been mentioned by others, part of the lack of stability of the SER (or skfr) under isomorphisms is due to SER having rules for uniqueness - which don't have the confluence property. IN the present case, it shouldn't be too difficult for people using Windows to rate the two puzzles with rules for uniqueness de-activated.

However, I haven't checked all the rules in detail, but there may be more than rules for uniqueness without the confluence property.

In particular, **as the thresholds between different ratings are based on totally arbitrary numbers of "nodes" (an extra-logical entity), it is very likely that the rules corresponding to a given rating don't have the confluence property. As a result, some resolution path with these rules may find a solution with SER = 11.0, while another path followed by a morph will not find one (and will require higher SER).**

Note: both morphs have SER = 11.7. The iso problem here is only with skfr.

Re: The hardest sudokus (new thread)

by denis_berthier » Sun Jan 02, 2022 5:53 am

StrmCkr wrote:

Could this be systematic? Has someone studied this phenomenon in the past?

QUOTE

denis_berthier

2010 Supporter
Posts: 3334
Joined: 19 June 2007
Location: Paris

AFAIK, no to both questions.

StrmCkr wrote:

Check the solution chain lengths at Its max difficult step morphing puzzels can increase or decrease chain length which changers the difficulty rating.

SER/skfr are not based on "chain length" (which they don't define), but on the number of basic inferences ("nodes") in each step (which can't be defined in pure logic terms).

StrmCkr wrote:

Or sometimes a morph can remove a uniqueness arguments construct to aform not covered in cases annalasis leading to. Higher rating or uncover one by the change lowering the result

Right. And a single elimination can drastically change the rating of a puzzle, regardless of what it is based on.

