

The hardest sudokus (new thread)

POSTREPLY

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Re: The hardest sudokus (new thread)

by champagne » Thu Aug 13, 2020 5:55 am

Mathimagic wrote:
Thanks, Tarek!

Sampling 10 million 18C minimal puzzles suggests 1 in ~900 are pearls, BTW. That's pretty close to the 17C case (57, or 1 in 862)

Are there any instances of non-minimal pearls?

Hi Mathimagic,

just considering the definition of a pearl and of a diamond, taking a puzzle and making simplest moves first, you reach the position where the remaining puzzle is a diamond. You are in basically in a pearl position when you have done all moves rated below 2.3 if you take this as start.


Hope this is the right answer to your point

QUOTE

champagne

2017 Supporter

Posts: 7269
Joined: 02 August 2007
Location: France Brittany



Re: The hardest sudokus (new thread)

by Mathimagic » Thu Aug 13, 2020 8:03 am

What I meant was, can a Pearl (no singles available) have redundant clues?

Conversely, can we add clues to a Pearl and still get a Pearl? It seems that we can:

CODE: SELECT ALL

.....56...4.....23...1.....1..7.3...6.....4...3...8.....8.2..4.....56.18c
.....56...4.....23...1.....1..7.3...6.....4...3...8.....8.2..4.....56219c

And we can add even more, the max on this puzzle is 37 clues:

CODE: SELECT ALL

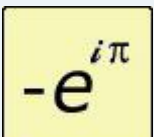
.....567.94..7...23..91.3...21..7.39...6.9...274.9.3.2..8.....8.2..493.94.8.756237c

QUOTE

Mathimagic

2017 Supporter

Posts: 1902
Joined: 27 May 2015
Location: Canberra



Re: The hardest sudokus (new thread)

by tarek » Thu Aug 13, 2020 11:15 am

I'm not sure where all of the is leading to. If you are solving using resolution rules that have singles at the bottom. Then each time you use a non single technique you are technically in a Pearl position


I'm not sure where to find it now but somebody has a thread with puzzles having the maximal number of clues for each SE rating which is impressive

Tarek

QUOTE

tarek

Posts: 3759
Joined: 05 January 2006



Re: The hardest sudokus (new thread)

by 1to8only » Thu Aug 13, 2020 11:44 am

<http://forum.enjoysudoku.com/maximum-number-of-clues-for-a-given-se-rating-t6210-120.html#p281374>

QUOTE

1to8only

Posts: 4075
Joined: 04 April 2018

Re: The hardest sudokus (new thread)

by Mathimagic » Thu Aug 13, 2020 1:30 pm

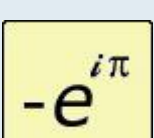
Sorry for the meaningless diversion ... I seem to have gotten all my pearls in a jam 🐼

QUOTE

Mathimagic

2017 Supporter

Posts: 1902
Joined: 27 May 2015
Location: Canberra




Re: The hardest sudokus (new thread)

by tarek » Thu Aug 13, 2020 3:07 pm

Mathimagic wrote:
Sorry for the meaningless diversion ... I seem to have gotten all my pearls in a jam 🐼


surly that is still better than getting your leopard deaf?



QUOTE

tarek

Posts: 3759
Joined: 05 January 2006



Re: The hardest sudokus (new thread)

by Mathimagic » Thu Aug 13, 2020 3:14 pm

tarek wrote:
getting your leopard deaf?

Hysterical! 🐼

QUOTE

Mathimagic

2017 Supporter

Posts: 1902
Joined: 27 May 2015
Location: Canberra



Re: The hardest sudokus (new thread)

by Pupp » Thu Aug 13, 2020 8:21 pm

champagne wrote:

Mathimagic wrote:
Thanks, Tarek!

Sampling 10 million 18C minimal puzzles suggests 1 in ~900 are pearls, BTW. That's pretty close to the 17C case (57, or 1 in 862)

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Hi Mathimagic,

just considering the definition of a pearl and of a diamond, taking a puzzle and making simplest moves first, you reach the position where the remaining puzzle is a diamond. You are in basically in a pearl position when you have done all moves rated below 2.3 if you take this as start.

Hope this is the right answer to your point

QUOTE

Pupp

Posts: 246
Joined: 18 October 2019

Re: The hardest sudokus (new thread)

by mith » Thu Aug 13, 2020 8:45 pm

As I understand it, a pearl is a puzzle where the hardest rated move is required before you are able to place a digit, while a diamond is a puzzle needs its highest rated move to eliminate a candidate. (Though I think I've seen it also used for puzzles where the moves required for placing a digit / eliminating a candidate are above a certain threshold?)

SE gives a pearl and diamond rating, which is the rating required to place a digit or eliminate a candidate, respectively... at least for the techniques SE supports.

QUOTE

mith

Posts: 862
Joined: 14 July 2020

Re: The hardest sudokus (new thread)

by 1to8only » Thu Aug 13, 2020 8:57 pm

From: <http://forum.enjoysudoku.com/patterns-game-t6290.html>

g.r.emlin wrote:
Patterns Game ratings are the tuple ER/EP/ED:

- ER (explainer rating): the highest Sudoku Explainer rating of the methods leading to the puzzle solution
- EP (pearl rating): the highest Sudoku Explainer rating of the methods leading to the first cell placement
- ED (diamond rating): the highest Sudoku Explainer rating of the methods leading to the first candidate elimination

Ratings sort numerically from left to right, low to high. A pearl or diamond must have ER > 2.3.

QUOTE

1to8only

Posts: 4075
Joined: 04 April 2018

Re: The hardest sudokus (new thread)

by m_b_metcalf » Thu Aug 13, 2020 9:36 pm

1to8only wrote:
Pearl, ER=EP, e.g. ED=4.0/4.0/1.2. Diamond, ER=EP=ED, e.g. ED=5.0/5.0/5.0.

Small nit, I don't think 4.0/4.0/1.2 exists. Try 4.0/4.0/2.6.

Regards,


Mike

QUOTE

m_b_metcalf

2017 Supporter

Posts: 13227
Joined: 15 May 2006
Location: Berlin



Re: The hardest sudokus (new thread)

by Pupp » Sat Aug 15, 2020 8:41 pm

Just curious, but are there puzzles that would rate beyond 12 on Sudoku Explainer?

I had it crunch a puzzle off this thread and it clocked in at 11.9, and had Dynamic Region Forcing Chain, with a Dynamic Forcing Chain nested inside of it. (Not to mention many other steps that it seems only would be usable with puzzles at the Ludicrous level.)

12.3.....
4.....3..
..3.5.....
..42..5..
...8...9
..6...5.7..
..15...2..
...9...6..
.....7.8

Difficulty rating: 11.9 (Dynamic Region Forcing Chains (+ Dynamic Forcing Chains))
This Sudoku can be solved using the following logical methods:
55 x Hidden Single
1 x Direct Hidden Pair
3 x Naked Single
7 x Pointing
1 x Claiming
1 x Hidden Pair
2 x Naked Triplet
1 x Skyscraper
1 x Two-string Kite
1 x XY-Wing
1 x XYZ-Wing
1 x WXYZ-Wing 137
1 x VWXYZ-Wing 1412
1 x VWXYZ-Wing 2411
1 x VWXYZ-Wing 139
2 x Forcing Chain
1 x Nishio Forcing Chains
4 x Cell Forcing Chains
3 x Region Forcing Chains
6 x Dynamic Cell Forcing Chains
21 x Dynamic Contradiction Forcing Chains
6 x Dynamic Region Forcing Chains
1 x Dynamic Region Forcing Chains (+)
2 x Dynamic Contradiction Forcing Chains (+)
11 x Dynamic Contradiction Forcing Chains (+ Forcing Chains)
1 x Dynamic Region Forcing Chains (+ Forcing Chains)
3 x Dynamic Contradiction Forcing Chains (+ Multiple Forcing Chains)
5 x Dynamic Contradiction Forcing Chains (+ Dynamic Forcing Chains)
3 x Dynamic Region Forcing Chains (+ Dynamic Forcing Chains)

QUOTE

Pupp

Posts: 246
Joined: 18 October 2019

Re: The hardest sudokus (new thread)

by mith » Sun Aug 16, 2020 4:07 am

11.9 is the highest found for regular sudoku - there are 9 such puzzles in the database. I think someone posted a few 12s for Sudoku X earlier in the thread?

QUOTE

mith

Posts: 862
Joined: 14 July 2020

Re: The hardest sudokus (new thread)

by Pupp » Sun Aug 16, 2020 3:48 pm

mith wrote:
11.9 is the highest found for regular sudoku - there are 9 such puzzles in the database. I think someone posted a few 12s for Sudoku X earlier in the thread?

Thanks. Just curious, but does anybody know the highest difficulty for normal sudoku puzzles they use in competition?

There has to be some sort of upper bound, since solvers have a time limit to solve a puzzle.

QUOTE

Pupp

Posts: 246
Joined: 18 October 2019

Re: The hardest sudokus (new thread)

by 1to8only » Sun Aug 16, 2020 4:56 pm

Pupp wrote:
anybody know the ... difficulty for normal sudoku puzzles they use in competition?

In the 14th World Sudoku Championship 2019, this was one sudoku puzzle, it solves with singles only:

CODE: SELECT ALL

12.....34.5.79.....6...5..987...4.....6...321..8...4.....48.5.67.....89 ED=1.5/1.2/1.2

In sudoku competitions, solvers have limited time to solve about 10 sudoku variants, with points awarded for correct solutions.
If you want more info (a sampler of sudokus in the competition), visit <https://wspe2019.de/wsc.php>, and download the Instruction Booklet pdf.

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QUOTE

1to8only

Posts: 4075
Joined: 04 April 2018

