The New Sudoku Players' Forum ر...Search Sponsored by Enjoy Sudoku The hardest sudokus (new thread) POSTREPLY ∠ Search this topic... 1330 posts • Page 1 of 89 • 1 2 3 4 5 ... 89 QUOTE The hardest sudokus (new thread) by **tarek** » Fri Jan 09, 2009 4:03 am For the latest compiled list of potential hardest puzzles (Sep 30 2019) please visit champagne's https://drive.google.com/drive/folders/0B5lH6mGXxWzXTDFRMnVTbGNlZU0 and download ph_1910.zip The following 2 posts reflect all updates until June 2011 Posts: 3759 Joined: 05 January 2006 The latest Hardest sudokus Database can be downloaded by following this link: HardestDatabase110626.txt The following is a "Top 5" list of hardest sudokus according to some popular sudoku rating programs (See next post for more info) q1 Top 5 CODE: SELECT ALL Rating Program: gsf's sudoku q1 Rating: 99529 Poster: eleven Label: HardestSudokusThread-02085;Discrepancy 12. | 4.. | 3.. 3 . . | . 1 . | . 5 . . . 6 | . . . | 1 . . 7 . . | . 9 . | 4 . | 6 . 3 | 3 | . . 2 | . . . 5 . . | . 8 . | 7 7 | . . . 5 . . . 9 8 Rating Program: gsf's sudoku q1 Rating: 99495 Poster: eleven Label: HardestSudokusThread-02023;cigarette . . 5 | . . . | . . . -----+-----+-----6 . 2 | 4 . . | 5 | . 6 . | . 7 | . . 8 | . . 6 ----+----. . 4 | 2 . . | 3 | . . 9 | . 8 . Rating Program: gsf's sudoku q1 Rating: 99486 Poster: coloin Label: HardestSudokusThread-00078;Platinum_Blonde . . . | . . . | . 1 2 . . . | . . . | . . 3 -----. . 1 | 8 . . | . . 5 . 6 . | . 7 . | 8 . . -----+-----+-----. . 8 | 5 . . | . . . 9 . . | . 4 . | 5 . . 47. | . . 6 | . . . Rating Program: gsf's sudoku q1 Rating: 99432 Poster: eleven Label: HardestSudokusThread-00209;Cheese . 2 . | . 5 . | 7 . . . 4 . . | 1 . . . | . . . 6 8 . . | . . . 3 | ----+----2 . . | . . 8 | . . 3 . 4 . | . 2 . | 5 | 6 . . | . 1 . -----. . 2 | . 9 . | 9 . | . . . | . . 5 7 . 4 | . . . | 9 . . Rating Program: gsf's sudoku q1 Rating: 99420 Poster: tarek Label: HardestSudokusThread-00041;tarx0001;Fata_Morgana . . . | . . . | . . . 3 . . 1 | . . . 5 | 6 . . . 9 . | . 4 . | . 7 . -----+-----+-----. . . | . . 9 | . 5 . 7 . . | . . . | . . 8 -----. 8 . | . 2 . | . 9 . 6 . . | . . . | . . . SE Top 5 **CODE: SELECT ALL** Rating Program: Nicolas Juillerat's Sudoku explainer 1.2.1 Rating: 11.9 (ER/EP/ED=11.9/11.9/11.3) Poster: tarek Label: HardestSudokusThread-00058;Golden_Nugget;pearly6000-1812 . . . | . . . | . 3 9 . . . | . . 1 | . . 5 . . 3 | . 5 . | 8 . . -----. . 8 | . 9 . | . . 6 . 7 . | . . . 2 | ----+----. . 9 | . 8 . | . 5 . . 2 . | . . . | 6 . . 4 . . | 7 . . | . . . Rating Program: Nicolas Juillerat's Sudoku explainer 1.2.1 Rating: 11.9 (ER/EP/ED=11.9/11.9/9.9) Poster: eleven Label: HardestSudokusThread-00208;Kolk 12. | 3. . | . . . 4 . . | . . . | 3 3 | . 5 . | . . . -----. . 4 | 2 . . | 5 | . 8 . | . . 9 . 6 . | . . 5 | . 7 . . . 1 | 5 . . | 2 | . 6 | . . . 8 Rating Program: Nicolas Juillerat's Sudoku explainer 1.2.1 Rating: 11.9 (ER/EP/ED=11.9/11.9/2.6) Poster: eleven Label: HardestSudokusThread-02095;Patience 12. | 3. . | . . . 6 . . | 1 . . | 3 4 | 5 3 . | | . . 8 | . . 9 ----+----+----. . . | 45. | 1. | . . . | . 8 . Rating Program: Nicolas Juillerat's Sudoku explainer 1.2.1 Rating: 11.9 (ER/EP/ED=11.9/1.2/1.2) Poster: eleven Label: HardestSudokusThread-00211;Imam_bayildi . . 3 | . . 6 | . 8 | 1 . . | 2 | . 7 . | . . 4 -----. . 9 | . . 8 | . 6 . . 3 . | . 4 . | . . 1 3 . . | . . 5 | 5 | . . . | 6 . . Rating Program: Nicolas Juillerat's Sudoku explainer 1.2.1 Rating: 11.8 (ER/EP/ED=11.8/11.8/11.6) Poster: eleven Label: HardestSudokusThread-00212 1 . . | . . . | . . 9 . . 6 | 7 . . | . 2 . . 8 . | . . . | 4 . . -----+-----+-----. . . | . 7 5 | . 3 . . . 5 | . . 2 | 6 . | 3 . . | . . . ----+----+ . 9 . | . . . | 8 . . 6 . . | . 4 . | . . 1 . . 2 | 5 . . | . 6 . q2 Top 5 CODE: SELECT ALL Rating Program: gsf's sudoku q2 Rating: 99743 Poster: eleven Label: HardestSudokusThread-00245;Red_Dwarf 12. | 3.. | . . 4 3 5 . | . . . | 1 . . -----. . 5 | 4 . . | 2 . . -----. . 3 | 1 . . | 5 | . . 9 | . 7 | . 6 . | . . 8 Rating Program: gsf's sudoku q2 Rating: 99587 Poster: eleven Label: HardestSudokusThread-02023;cigarette . . 5 | . . . | . . . -----6 . 2 | 4 . . | 5 | . 6 . | . 7 | . . 8 | . . 6 ----+----. . 4 | 2 . . | 3 9 . . . 9 . . . 9 9 Rating Program: gsf's sudoku q2 Rating: 99578 Poster: eleven Label: HardestSudokusThread-02085;Discrepancy 12. | 4. . | 3. . 3 . . | . 1 . | . 5 . . . 6 | . . . | 1 . . 5 . . | . 8 . | 7 5 . . . | . . . 5 Rating Program: gsf's sudoku q2 Rating: 99551 Poster: coloin Label: HardestSudokusThread-00078;Platinum_Blonde . . . | . . . | . 1 2 . . . | . . . | . . 3 . . 2 | 3 . . | 4 . . -----. . 1 | 8 . . | . . 5 . 6 . | . 7 . | 8 | . . 9 | . . . ------. . 8 | 5 . . | . . . 9 . . | . 4 . | 5 . . 4 7 . | . . 6 | . . . Rating Program: gsf's sudoku q2 Rating: 99516 Poster: eleven Label: HardestSudokusThread-00209;Cheese . 2 . | . 5 . | 7 . . 4 . . | 1 . . | . . 6 8 . . | . . . 3 | . . . -----2 . . | . . 8 | . . 3 . 4 . | . 2 . | 5 | 6 . . | . 1 . -----Suexrat9 Top 5 **CODE: SELECT ALL** Rating Program: dukuso's suexrat9 Rating: 10364 Label: HardestSudokusThread-01418;coloin 4 . . | . 8 . | . 3 6 . . 8 | . . . | 1 . . -----. 4 . | . 6 . | . 7 3 . . . | 9 . . | | . . 2 | . . 5 ----+----. . 4 | . 7 . | . 6 8 Rating Program: dukuso's suexrat9 Rating: 9968 Poster: eleven Label: HardestSudokusThread-02087 1 . . | . 5 . | 7 | . . 9 | . 3 . . . 9 | . . 7 | 5 4 . ----+----. . 4 | . . 3 | . 7 . -----+-----+-----. . . | 79. | . 2. . . . | . . 2 | 4 . 3 Rating Program: dukuso's suexrat9 Rating: 9453 Poster: eleven Label: HardestSudokusThread-01419 . 4 . | . 6 . | . 7 3 6 . . | Rating Program: dukuso's suexrat9 Rating: 9195 Poster: eleven Label: HardestSudokusThread-01629 . . 3 | . . . | 4 . . | . 8 . | . 3 6 . . 8 | 3 . . | 1 . . -----+----+----. 4 . | . 6 . | . 7 3 . . 4 | . 7 . | . 6 8 Rating Program: dukuso's suexrat9 Rating: 8946 Poster: coloin Label: HardestSudokusThread-02061 . . 3 | . 9 . | . . . 4 . . | . 8 . | . 3 6 . . 8 | . . . | 1 . . . 4 . | . 6 . | . 7 3 . . . | 9 . . | ----+----. . 4 | . 7 . | . 6 8 **Suexratt Top 5** CODE: SELECT ALL Rating Program: dukuso's suexratt Rating: 5796 Poster: eleven Label: HardestSudokusThread-01418;coloin -----. 4 . | . 6 . | . 7 3 ----+----. . 4 | . 7 . | . 6 8 6 . . | . . . | . . . 7 . . | 6 . . | 5 . . Rating Program: dukuso's suexratt Rating: 5693 Poster: eleven Label: HardestSudokusThread-01629 . . 3 | . . . | . . . 4 . . | . 8 . | . 3 6 . . 8 | 3 . . | 1 . . -----. 4 . | . 6 . | . 7 3 . . 4 | . 7 . | . 6 8 6 . . | . . . | . . . 7 . . | . . . | 5 . . Rating Program: dukuso's suexratt Rating: 4969 Poster: eleven Label: HardestSudokusThread-02087 ----+----. . 4 | . . 3 | . 7 . . 6 . | . . . | . . . ----+----+----. . . | 7 9 . | . 2 | . . 2 | 4 . 3 Rating Program: dukuso's suexratt Rating: 4931 Poster: eleven Label: HardestSudokusThread-01419 4 . . | . 8 . | . 3 6 . . 8 | . . . | 1 . . . 4 . | . 6 . | . 7 3 -----. . 4 | . 7 . | . 6 8 6 . . | . . 4 | . . . 7 . . | 5 . . Rating Program: dukuso's suexratt Rating: 4743 Poster: eleven Label: HardestSudokusThread-02092 1 . . | 4 . . | . . 9 . 5 6 | . . 9 | | . 1 . | . 6 . ----+----. 6 . | . . . | 8 . . 5 . . | . . 4 | . 9 . 9 . . | . . 5 | . 1 . -----+-----+-----. 7 . | . . . | 2 . . 6 . . | . . 1 | . 5 | 3 . . | . . . tarek Last edited by tarek on Fri Oct 04, 2019 7:00 pm, edited 15 times in total. QUOTE by **tarek** » Fri Jan 09, 2009 4:04 am This is to reserve the 2nd post for material related to the 1st post above (links, history,) again, this also should be updated soon & hopefully on a regular basis Popular downloadable rating programs: Posts: 3759 Joined: 05 January 2006 Sudoku Explainer 1.2.1 by Nicolas Juillerat, for the Explainer rating (ER) serate (a modified Sudoku Explainer 1.2.1, for the Explainer, Pearl & Diamond ratings (ER, EP & ED)) sudoku by gsf, for q1, q2 & other functions suexrat9 by dukuso, for the suexrat9 rating (sx9) suexratt by dukuso, for the suexrat9 & suexratt ratings (sx9 & sxt) Links to rated puzzles on other pages (Last update dates provided when possible): Ravel's Original Hardest Sudokus thread & RMS top list (updated 02 May 2007) Ravel's Latest RMS top list (updated Jan 08 2008) JPF's 10.5+ ER list (updated 15 Apr 2007) gsf's q1 taxonomy list (? updated Dec 2007) gsf's q2 taxonomy list (? updated Dec 2007) Links to pages with information on "Hardest Puzzles": eleven's sudo-eleven Hardest sudoku page The making of a gotchi, a simple way to find extreme sudokus thread Command Line examples under windows for rating a group of puzzles: **CODE: SELECT ALL** sudoku -q1 puzzles.txt -o q1.txt (q1 rating) sudoku -q2 puzzles.txt -o q2.txt (q1 rating) suexratt puzzles.txt 1000 2 > Sxtr.txt (for Sx9 & Sxt screening rating, faster) suexratt puzzles.txt 10000 2 > Sxtr.txt (for Sx9 & Sxt database rating, slower) java -Xrs -Xmx500m -cp SudokuExplainer.jar diuf.sudoku.test.serate -i puzzles.txt -f %%r/%%p/%%d/%%g/%%e -o serate.tXt (for ER/EP/ED in Sudoku Explainer) A database of hardest puzzles is maintained with the following suggested filters: **CODE: SELECT ALL** Entries should have: Q1 >=99000 OR Q2 >=99100 OR SX9 >=4200 OR SXT >=2000 OR ER >=11.6 Preferable Database fields (unknown fields to be left empty): CODE: SELECT ALL Puzzle in line format Label(s) Poster(s) q2 ER EP sx9 sxt tarek Last edited by tarek on Sun Jul 03, 2011 8:18 pm, edited 3 times in total. QUOTE □ by ttt » Sun Jan 11, 2009 7:39 pm Posts: 185 Hi tarek, Joined: 20 October 2006 Great works! Location: vietnam For hardest puzzles, I see that there are 4 types of them: - Type 1: puzzles with symmetries that can solve based on **Gurth**'s methods and great works recently by **eleven**, **glyn**, **udosuk**... here. - Type 2: puzzles contain SK loops here like Easter Monster... - Type 3: puzzles contain "floors" like Platinum Blonde, Fanta Morgana, Trompe L'oeil... and can solve as here or here - Type 4: the rest, some of them contain "almost SK loop" like tarx0075, Silver Plate... that has not yet nice solutions or paths (at least by me), I'm still thinking on them and coly013. Something's wrong or missing...? BTW, I hope I have time to solve "all" your Pearly6000 ttt "QUOTE by ronk » Sun Jan 11, 2009 11:08 pm 2012 Supporter Posts: 4764 **66** tarek wrote: Joined: 02 November 2005 Popular downloadable rating programs: Location: Southeastern USA Links to rated puzzles Preferable Database fields (unknown fields to be left as 0): CODE: SELECT ALL Puzzle in line format Puzzle in row normal minlex line format Label(s) Poster(s) Date: yyyymmddhhmmss format q2 ER ED sxt tarek, thanks for a very nice directory to ratings programs and the ratings of difficult puzzles. As to the database: 1) Is the overall format to be csv -- comma separated values? 2) Is a "c14n" (row normal minlex canonicalization) field actually useful? When prospecting for new difficult puzzles, one needs to be sure the same algorithm is applied to prospective puzzles and their c14n library. Doesn't this mean virtually everyone will build their own c14n library anyway? 3) I now see some of those long labels, like tarek071223170000-170, included hours, minutes, and seconds. Is such time precision really necessary? QUOTE □ by **gsf** » Mon Jan 12, 2009 2:33 am 2014 Supporter Posts: 7306 66 ronk wrote: Joined: 21 September 2005 3) I now see some of those long labels, like tarek071223170000-170, included hours, minutes, and seconds. Is such time precision really necessary? Location: NJ USA yes, nice work -- sorry that the depth of g.r.emlin's todo list pushed this work back I thought about labels a bit -- how about userYYMMDDcc where ccc is a counter that starts at 01 each day "QUOTE □ by **tarek** » Mon Jan 12, 2009 6:38 am Thanks for the kind words everybody, still some work to do though (most of what I posted was already done) 66 ronk wrote: 1) Is the overall format to be csv -- comma separated values? Posts: 3759 Joined: 05 January 2006 The idea is to keep a database somewhere for organization purposes. Posting puzzles to me using whatever sperator shouldn't be a problem ... for general posting, the csv format is widely acceptable 66 ronk wrote: 2) Is a "c14n" (row normal minlex canonicalization) field actually useful? When prospecting for new difficult puzzles, one needs to be sure the same algorithm is applied to prospective puzzles and their c14n library. Doesn't this mean virtually everyone will build their own c14n library anyway? This is to make sure (For me at least) that the puzzles are unique in the database. Most of the fields can be filled electronically through gsf & dukuso's programs.... That means that filling all fields is preferable but not manadatory ... The manadatory fields should be: 1. Puzzle in line format. 2. ER (not EP or ED) [because it is time consuming for me to do] 66 ronk wrote: 3) I now see some of those long labels, like tarek071223170000-170, included hours, minutes, and seconds. Is such time precision really necessary? This is to sort puzzle chronologically. I agree that hhmmss is a bit excessive. gsf's suggestion is appropriate (YYMMDDcccc) All of this is simple for new submissions ... The problem is finding old ones (maybe g.r.emlin could help) ... If it is too much of a problem we can omit it !! tarek QUOTE by **tarek** » Mon Jan 12, 2009 8:17 am 66 ttt wrote: For hardest puzzles, I see that there are 4 types of them: Posts: 3759 Joined: 05 January 2006 I'm looking to update the above post with some form of reference to these topics ... Thanks 66 ttt wrote: BTW, I hope I have time to solve "all" your Pearly6000 Good luck, you'll need it tarek QUOTE briturner by briturner » Tue Jan 13, 2009 1:04 am Posts: 3 greetings, Joined: 12 January 2009 I have just recently started generating sudokus, but nowhere near these in difficulty level (but I am still learning). Can you add 1 more piece of information to the second post. The command line (where applicable) used to produce the output (understanding gsf's command line options can be a daunting task). You say convert to row normal minlex line format, and provide q1 and q2, but now how to produce them. Also, a couple questions: - Are ratings only applied to normal minlex version, since swapping numbers or rotating can cause large variations in ratings (depending on the program)? - Are you only collecting the absolute most difficult (thus only a q1 rating of 99486+ should be submitted), or just really hard (maybe all with a q1 rating of 99000+)? If more than just the absolute hardest, what is the thresholds? - The absolute hardest are posted, but are the runner-up in the database available someplace? thank you brit "QUOTE by champagne » Tue Jan 13, 2009 2:15 am champagne 2017 Supporter Posts: 7269 **66** ttt wrote: Joined: 02 August 2007 For hardest puzzles, I see that there are 4 types of them: Location: France Brittany - Type 1: puzzles with symmetries that can solve based on Gurth's methods and great works recently by eleven, - Type 2: puzzles contain SK loops here like Easter Monster... - Type 3: puzzles contain "floors" like Platinum Blonde, Fanta Morgana, Trompe L'oeil... and can solve as here or here - Type 4: the rest, some of them contain "almost SK loop" like tarx0075, Silver Plate... that has not yet nice solutions or paths (at least by me), I'm still thinking on them and coly013. Hi ttt, I would say that differently. Ranking using the tools described here give a good idea of the overall difficulty except if a special tool can ease the path. For the list of identified specificities, I would globally agree : 1) "symmetry" 2) SK loop 3) Most of those having the "bi bi" pattern I am more restrictive than you on the wording for point 3. Allan Barker model can solve any puzzle if you increase the number of floors. On the other side, I don't know f Silver Plate will solved easily although it has the "bi bi" pattern. Puzzles having nearly the SK loop could enter that field, but nothing clear up to now. I can not exclude that a puzzle have both 2) and 3), but the test I made on Easter Monster shows some partial "bi bi", not a full picture. champagne QUOTE by tarek » Tue Jan 13, 2009 6:03 am **66** briturner wrote: Can you add 1 more piece of information to the second post. The command line (where applicable) used to produce the output (understanding gsf's command line options can be a daunting task). You say convert to row normal minlex line format, and provide g1 and g2, but now how to produce them. That should be easy Posts: 3759 Joined: 05 January 2006 **66** briturner wrote: - Are ratings only applied to normal minlex version, since swapping numbers or rotating can cause large variations in ratings (depending on the program)? ratings are applied to the original puzzle **66** briturner wrote: - Are you only collecting the absolute most difficult (thus only a q1 rating of 99486+ should be submitted), or just really hard (maybe all with a q1 rating of 99000+)? If more than just the absolute hardest, what is the thresholds? I think that a cut-off is best. (I will look into it, mostly top 50 in each category based on my pearly6000 collection) **66** briturner wrote: - The absolute hardest are posted, but are the runner-up in the database available someplace? None that specific ... The database would hopefully have them When the database is up & running ... I could post the file renamed using the date posted on public site, each update would have a different name to reflect the update QUOTE by **999_Springs** » Tue Jan 13, 2009 7:37 am 999_Springs Posts: 585 Has the #77 from the top1465 completely disappeared out of sight from everything regarding the hardest puzzles? Joined: 27 January 2007 Location: In the toilet, flushing down springs, one by one. QUOTE by tarek » Tue Jan 13, 2009 7:42 am Suggested database filter: **CODE: SELECT ALL** Entries should have: Q1 >=99000 OR Q2 >=99100 OR Posts: 3759 SX9 >=4200 OR Joined: 05 January 2006 SXT >=2000 OR ER >=11.6 These figures were based on my personal collection. **66** 999_Springs wrote: Has the #77 from the top1465 completely disappeared out of sight from everything regarding the hardest puzzles If the filter above was applied the #77 would have disappeared long long ago Many entries generated in the patterns game are much more difficult and still below the standards of the hardest. 0 QUOTE by briturner » Tue Jan 13, 2009 1:45 pm briturner Posts: 3 Greetings, Joined: 12 January 2009 As a followup question, what do you do about variations with better scores? For example, take coly013. Number substitution, swapping rows and col, and rotation can produce the same logical puzzle with higher scores: **CODE: SELECT ALL** suexratt test.txt 10000 2 rating: 6610 , 3169 ,9..5..1.....3...23..7....45...7.8.....2......64...9..1....8..6......54....7 3149 , 3.....9.6.4.2...8.....6.....5.8...2...9...3.7.....7....1...42..........1.5.81..... rating: 6986 , rating: 6571 , 3365 ,2..5..67..4.....9..8.7..9...6..4..7...1....8..6.3..1..3......24....5... rating: 6101 , 2768 , 1..5....2....3...4.6.1....6..7....8.....94...8.2.....9..7.4..1.6......5..3 totalnodes:262707078 Do you just note the higher score, or make a separate entry? I also noted that even changing the puzzles before the puzzle under test can alter the rating (at least with suexratt). I can show the 2nd puzzle rating to at least 7000, and the 3rd to 3399 for the second score. I do not know how to run Q1 or Q2 scores, or min-lex versions, but I assume gsf's sudoku suffers from the same issues. thanks brit QUOTE by **gsf** » Tue Jan 13, 2009 3:28 pm 2014 Supporter Posts: 7306 **66** briturner wrote: Joined: 21 September 2005 As a followup question, what do you do about variations with better scores? Location: NJ USA For example, take coly013. Number substitution, swapping rows and col, and rotation can produce the same logical puzzle with higher scores: CODE: SELECT ALL suexratt test.txt 10000 2 rating: 6610 , 3169 , ...9.5.1...3..23..7...45...7.8...2....64...9.1...8..6....54....7 rating: 6986 , 3149 , 3...9.6.4.2...8...6....5.8...2...9...3.7....7...1...42......1.5.81.... rating: 6571 , 3365 , ...2.5..67..4....9..87..9...6..4..7..1...8..6.3..1..3.....24...5... rating: 6101 , 2768 , 1..5...2...3...4.6.1...6..7...8...94...8.2....9..7.4.1.6.....5..3 totalnodes:262707078 Do you just note the higher score, or make a separate entry? I also noted that even changing the puzzles before the puzzle under test can alter the rating (at least with suexratt). I can show the 2nd puzzle rating to at least 7000, and the 3rd to 3399 for the second score. I do not know how to run Q1 or Q2 scores, or min-lex versions, but I assume gsf's sudoku suffers from the same issues. suexrat by definition is an average over n equivalent permutations of the input puzzle because of this it can be sensitive to the original input puzzle orientation the -q2 rating of my solver was designed to be resistant to input puzzle permutations this command line runs the q2 rating on 100 permutations of the first puzzle above CODE: SELECT ALL sudoku -q2 -J100 -f%r9..5..1.....3...23..7....45...7.8.....2......64...9..1....8..6......54....7 one run (each run starts with a different pseudo random seed) it produced this range of ratings **CODE: SELECT ALL** 6 98818 21 98819 23 98820 29 98821 19 98822 3 98823 -q2 sensitivity on input puzzle orientation tends to be in the noise QUOTE □ by **ronk** » Tue Jan 13, 2009 4:54 pm 2012 Supporter Posts: 4764 Joined: 02 November 2005 suexrat by definition is an average over n equivalent permutations of the input puzzle Location: Southeastern USA because of this it can be sensitive to the original input puzzle orientation Ignoring digit swaps and the transpose (diagonal reflection), there are only 46,656 permutations, so I sure would have expected an average of 10,000 permutations to show better results. Evidently digit swaps and diagonal reflection are significant factors for suexrat. 0 Display posts from previous: All posts ✓ Sort by Post time ✓ Ascending ✓ Go Next : POSTREPLY ⊭ 1330 posts • Page 1 of 89 • 1 2 3 4 5 ... 89 Return to General Jump to: General **∨** Go Powered by phpBB® Forum Software © phpBB Group PHPBB SEO.COM