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Our Killer Sudoku Calculator is a powerful tool designed to assist puzzle enthusiasts in solving complex Killer Sudoku puzzles. Killer Sudoku, also known as Sum Sudoku, is a challenging variation of the classic Sudoku puzzle that combines elements of Sudoku and Kakuro.How It WorksThe calculator uses advanced algorithms to analyze the cage values you input and provides possible combinations that satisfy the sum constraints. It takes into account the standard Sudoku rules, ensuring that each row, column, and 3x3 box contains the digits 1-9 without repetition.Benefits of Using Our CalculatorSaves time on complex calculationsHelps you learn advanced solving techniquesImproves your problem-solving skillsEnhances your understanding of number relationshipsTips for Solving Killer SudokuWhile our calculator is a valuable tool, it's important to develop your own solving skills. Here are some tips to improve your Killer Sudoku solving abilities:Start with the smallest cages, especially those with only one or two cells.Look for cages that must contain specific digits based on their sum and size.Use the standard Sudoku rules to eliminate possibilities in rows, columns, and boxes.Practice regularly to familiarize yourself with common patterns and combinations.Whether you're a beginner looking to learn or an experienced player seeking to improve, our Killer Sudoku Calculator is here to support your puzzle-solving journey. Enjoy the challenge and happy solving! A killer sudoku is a type of Sudoku puzzle with an extra constraint. In addition to the usual Sudoku rule that each row, column and box must contain a set of the numbers 1 through 9, it adds a constraint that the sums of the numbers in some additional regions (shown as dashed boxes to the right) must match some given numbers. Solving a tough killer Sudoku typically requires knowing the combinations that sum to various targets. I built this calculator as an assistant to have to hand while I'm solving some of these problems having not yet memorized many of the common combinations. Select your target number, and the number of constituent numbers that must sum to that. Optionally, select any numbers that should be excluded from the available combinations. Additionally, click any combination to strike it out. Clicked combinations will be marked with an asterisk to denote that they were manually deselected. Find combinations that sum to {{ t }} in {{ n }} numbers, excluding {{ index }} {{ message }} Craig M. Booth, 2021 The solver's been a learning exercise for rust and as such - the code isn't excellent. There are some neat tricks in it though! It uses bitsets to improve performance, where possibilities for each cell are stored as a single binary number. If [1,3,5] were candidates for a square this is stored as \(000010101\) - where the least significant digit corresponding to 1 being a candidate etc. When a number is placed in a square it can be removed as a candidate from row/column/box efficiently using binary digits. Sums constraints are calculated and cached in a hashset. If a constraint required us to make 8 in 3 squares there are only two ways to do it: [1,2,5] and [1,3,4]... And is similarly stored as a mask: \(000011111\) - corresponding to all numbers that could make up a solution. This can be used to quickly mask squares. The calculation of these constraints is done quickly and lazily with some dynamic programming tricks - i.e. knapsack. When a digit is placed in a cell two things happen - its value is removed as a candidate from row/column/box, then sum constraints containing the cell are updated and the resulting new mask is reapplied to the remaining squares. If those rules are enough to solve the puzzle - it's extremely fast. It can solve up to 2 million sudokus per second! Otherwise, it must guess a square and backtrack if it reaches a contradiction. It tries to guess the square with the fewest candidates. It's lack of more complex solving techniques; hidden singles, naked pairs etc. means it struggles to compare with the fastest solvers of the day. For comparison it solves ~900/second of the 'puzzles5_forum_hardest' puzzles in the previous link (best=24,001/sec), while averaging a whopping 1456 guesses/puzzle (best=64 guesses). Not too bad for a weekend though… And it may in fact be the fastest killer sudoku solver! Killer Sudoku solver has quite a complicated definition and I hope the method I've created to enter a puzzle works for most people. The independent 'Designer' handles the entering of the clues and cages. Keeping this separate and being able to (loosely) validate the entry should allow puzzle solvers a fairly quick way of setting up the puzzle for solving. I hope you agree and I'd love to hear your feedback. You should also be aware of the Killer Cage Convention. February 2025: I have adapted the solver to work with Killer puzzles where single (1-cell) cages are blank. However it will display a warning that it expects all cages to add up to 405. Three examples added to the example list. Killer is based on Sudoku, so ultimately you need to place the numbers 1 to 9 on all the cell so that 1 to 9 is unique in every row, column and box. However, you will have few, if any, completed cells in Killer. Instead, groups of cells form blocks or 'cages' - and the clue is the sum of the solutions to those squares. Each 'cage' is shown by a color or dashed line. A clue of '3' in a two-cell cage means those cells will contain 1 and 2 - but it won't be obvious which way round at the start of the puzzle. Combinations are key to this puzzle at the outset, but all Sudoku strategies still apply. Killer specific strategies have been highlighted in cyan in the strategy list. New: Version 2.37.3 (8th Jul 2025) Completely new killer puzzle entry system. Two steps: Use your mouse to click and drag a set of cells into a cage. Much quicker than clicking on the borders. Then change to "clue setting" mode to enter clues. New: Version 2.36.4 (June 25th 2025) [Load Puzzle] I have been inspired by this Cracking The Cryptic video from a few years ago on solving Killer Sudokus to make the early strategies optional. If Simon here doesn't need a full candidate spread and Sudoku strategies (apart from one Quad) perhaps the solver does not. So now it is possible to turn of Pairs, Triples, Box Line Reduction, all the early Sudoku strategies (keep Quads on). And yes it can plough through. Under the hood I've increased the hit rate for Cage Unit Overlap. New: Version 2.36.1 (June 19th 2025) Added the Grader button. Feel confident this isn't going to be the CPU hog it once was. Added a Killer Cage Convention check and warning. New: Version 2.35.1 (May 31st 2025) Improved 'Hints Mode' next to Take Step. Choose between only revealing the next strategy, just the pattern or just the eliminations. New in version 2.31.4 (11th Feb 2025) Added Parity Strategy to the solver. New: Version 1.02 (June 13th 2009) Killer Sudoku Solver released Killer Sudoku is a great number puzzle that has all the best from the two worlds – Sudoku and Kakuro games. Since you're reading this article, you're probably a Killer Sudoku expert and there's no need to elaborate on the rules in detail.Expert Killer Sudoku levels are definitely not for the puzzle games rookies. The thing is that in the beginning of the game you don't have any numbers on the grid at all. This makes it tremendously difficult for people unfamiliar with at least basic Killer Sudoku strategies and techniques. On the other hand, if you're a sudoku veteran, feel free to challenge your skill!Expert Killer Sudoku TipsSo what's the first thing you should do when starting off with the completely empty grid? First and foremost, you need to always keep in mind the"45 rule".The "45 rule" is critical in helping you to get at a least a few numbers on the empty grid – this will later become the foundation for the whole game. Let us remind you in brief – the sum of all numbers in a row, column or 3x3 block is always equal to 45. Check the grid for a row, column of block which is made of a few complete cages and a cell that is a part of another cage. This way by subtracting the cages values from 45, you'll know what's inside that empty cell!This is a fantastic technique to jumpstart the game and place some of the first numbers on the grid. Once you have them, you can continue unraveling the ball and placing more and more numbers.Why you should play Killer SudokuExpert Killer Sudoku is probably one the hardest number puzzles out there. It's tremendously hard to solve, but it feels as much as rewarding when you're done with it. If you want to practice your concentration and logical thinking skills and you're a fan of some sophisticated strategies, expert Killer Sudoku is the right match for you. Killer Sudoku adds a new dimension to standard Sudoku, requiring arithmetic to solve. You will need new specialised Killer Sudoku solving techniques to progress in these puzzles besides the standard Sudoku techniques you will already know. The 45 Rule An essential Killer Sudoku solving technique is the "45 rule". This uses the fact that every row, column and block must contain each of the numbers 1 to 9 once. Therefore, the total of all numbers in one row, column or block will always be 45. Figure 1 Take the first column of the Killer Sudoku shown in Figure 1. The numbers in this column will add up to 45. Additionally, because the first four cages in this column (the 15 cage, the two 9 cages and the 7 cage) lie completely within the column, the numbers in the first eight squares total 15 + 9 + 9 + 7 = 40. Call this the 'inside total', because it is the total of all cages which lie completely inside the column. Now, as the whole column must add up to 45, the ninth square (the 'inside' square in this case as it is inside the column) must be 45 – 40 = 5. The 14 cage can now be completed by solving the other square as a 9. This could also have been solved another way, by finding the 'outside' total - the total of all cages within the column, including the one lying partly outside. This is 15 + 9 + 9 + 7 + 14 = 54. Again, as all the squares within the column must add up to 45, the 'outside' square is 54 – 45 = 9. In the case, it was easier to calculate the inside total, but if the cage lying partly outside has one square outside and more than one square inside, the outside total should be used to calculate the outside square. Figure 2 In general, to use the 45 rule, look for a row, column or block where all cages except one lie completely inside. For an inside square, the solution is always 45 – the inside total. For an outside square, the solution is always the outside total – 45. Multiple 45 Rule Multiple square 45 rule Cage combinations Generate Killer Sudoku There are three basic methods used to solving killer sudoku puzzles. The first is to use the strategies for solving regular sudoku puzzles. The second is to consider the different ways that a sum can be created. The third is to consider the total value of a region. Here we outline the basic strategies and then show how they are applied in a sample puzzle. At a later date we will post more complex strategies. (The Terminology used on this page is defined on the rules page.) The following are the basic rules used to solve killer sudokus. Rule of 1 This comes directly from the definition of sudoku. No region can contain any duplicate digits. In a sudoku region each digit appears exactly once. For example, if a digit appears in a row, it cannot be in any other cell in the row. Likewise, each digit can appear in a cage only once. If a digit is in a cage, it cannot appear in that cage again. Rule of Necessity This rule can be applied to sudoku regions (i.e., row, column, or nonet) or to a cage. In the former case, each region must contain all the digits one to nine. Thus, if all the digits but one appear in a row, the missing digit must appear in the empty cell. Rule of 45 Each sudoku region (i.e., row, column, or nonet) contains the digits one through nine. Thus, each sudoku region has a total value of 45. If S is the sum of all the cages contained entirely in a region, then the cells not covered must sum to 45-S. Rule of K The Rule-of-k is an extension of the Rule-of-1. If there are k cells contained entirely in a region that contain exactly k different possible values, then no other cell in that region can contain any of those k values. Sum Elimination This strategy examines the different possible ways of making the sum of a cage. Reducing the number of different possible ways of making a sum, can often lead to a potential solution. There are many ways of reducing the number of sums. For example, if a 2-cage has a total of 3, 4, 16, or 17 there is only one combination of values that can be used. (3=2+1, 4=3+1, 16=9+7, and 17=9+8.) 3-cages with only 1 combination are: 6=1+2+3, 7=1+2+4, 23=9+8+6, 24=9+8+7. The sum calculator found in the online player page can be very handy. more to come... Here we will use the above strategies to solve a puzzle. You might want to print out the puzzle so you can follow along all the steps. Rule of 45 Rule of necessity Rule of 1 Unique Sums Rule of K Rule of KLimited possible sums Rule of necessity Limited Possible Sums Rule of K Limited Possible SumsRule of 1Rule of K Rule of NecessityRule of 1All Possible Sums Rule of Necessity Limited possible sums Rule of KRule of 1Limited Possible Sums Remaining sumRule of 1Rule of KRule of necessity Sum Elimination Sum eliminationRule of 1 Range of TotalsSum Elimination Rule of 1Rule of necessityRemaining Sum Limited possible sumsRule of 1Rule of necessity Rule of necessityRule of 1 has arrived on this website! The SuDoku Solver now handles Killer SuDokus of all complexities. You can create, solve and analyse these puzzles just as you could before with 'normal' SuDokus. The Killer Solver is integrated into the existing SuDoku Solver. When you load a puzzle, the Solver understands which type of SuDoku it is. So to try it out, you just need to download the latest version of the free SuDoku Solver here. To create a Killer SuDoku (from a newspaper or puzzle book), there is a very nice click-and-drag functionality to allow capture of the 'cages'. The free version allows you to create Killer SuDokus, but not to save or print them. Otherwise it is fully-functioning for 30 days. To use the Killer Solver after that - and to extend its capabilities to include saving and printing - you can purchase a full copy here. I think it is the best Killer SuDoku Solver out there - try it for free! More screenshots can be seen below. They conform to all the rules of 'normal' SuDokus, but in addition they have Groups (or 'cages') that add up to a known total. The Groups are shown with a dashed-line boundary and with the total in the top-left corner. A number cannot be repeated within a Group - as well as not being repeated in a Row, Column, or Box. The first new strategy with Killer SuDokus is the '45 Rule'. Because each of the numbers 1 to 9 must appear once and only once in each Row, Column, or Box - so the total of each Row, Column, or Box will always be 45. Killer SuDokus can be found in puzzle books or in newspapers like the Times and the Daily Telegraph.

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