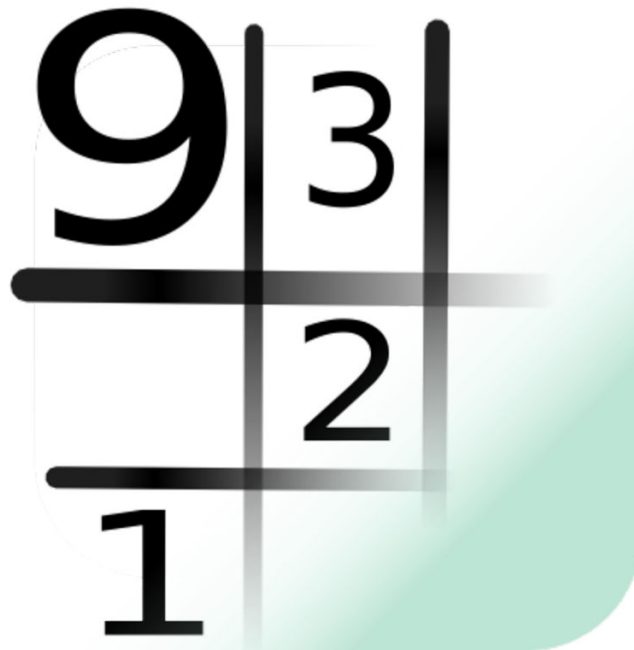


# The KSudoku Handbook

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## **Abstract**

This documentation describes the game of KSudoku, a logic-based symbol placement puzzle.

# Chapter 1

## Introduction

**GAMETYPE:**  
Logic, Board

**NUMBER OF POSSIBLE PLAYERS:**  
One

KSudoku is a logic-based symbol placement puzzle.

The player has to fill a grid with symbols so that each column, row and block on the game board contains only one instance of each symbol. In KSudoku the symbols are usually the numbers 1 to 9, but may be the letters A to P or A to Y in larger puzzles. Puzzles start with the board partially filled and it is your job to fill in the rest. Some types of puzzle have less than nine symbols.

When you start a game, you can choose from several Sudoku types and sizes. You can then have KSudoku generate a puzzle for you to solve or you can start with an empty board and enter in a puzzle from another source, such as a newspaper, then get KSudoku to check it and maybe solve it.

There are many variations of Sudoku in existence and KSudoku provides a good selection of them. The most common type, Standard Sudoku, has a 9x9 square grid and uses Arabic numerals 1 to 9 as symbols. The grid has 9 rows and 9 columns and is divided into 9 blocks of 3x3 squares. The problem is – each symbol can only be used once per row, column or block.

**NOTE**

It takes time and concentration to complete a game. However, solving Sudoku puzzles helps to increase overall brain activity and therefore is highly recommended.

## Chapter 2

# How to Play

**OBJECTIVE:**

Fill the grid so that each column, row and block contains only one instance of each symbol.

When the game starts you are prompted to choose which game type and board size you are interested in. You can enter in a puzzle from another source or have KSudoku generate a puzzle. The generator has several difficulty settings and some symmetry settings, which affect the pattern in which the puzzle is generated. Your game experience will depend on which of all these options you choose.

When the puzzle board appears, take a look at the left hand side. There is a selection list which contains all the symbols available in the current game. The set of symbols depends on the size of game you choose. Games may have 4, 9, 16 or 25 symbols. The first two sets use the numbers 1 to 4 or 1 to 9: the others use the letters A to P or A to Y.

First, note the boundaries in the game board. The thick lines outline the blocks. Each of these blocks has to be completed using the symbols available and each symbol must be used once and only once within the block. The same is true of the rows and columns in the board.

Now you can start entering symbols into the vacant squares on the board. To do that, select the symbol you wish to enter from the selection list on the left, then use the mouse to click on a vacant square in the board. Alternatively, you can hover with the mouse over a vacant square or use the cursor keys to move around, then use the keyboard to enter a symbol.

In Roxdoku (three-dimensional) puzzles, always use the mouse to set a small cube to a value and use a *double* click. When you rotate the large cube, by clicking and dragging with the mouse, it is easier to see what values are on the small cubes in the background if you click *between* the small cubes, not on them.

It is useful sometimes to enter markers or notes, which are tiny symbols within a square. These have no influence on the solution, but they can help you keep track of ideas you have had, especially when there is a choice between two alternatives and you do not yet have enough information to decide between them. To enter a marker or note, click with the right mouse button or hold down the **Shift** key when using the keyboard.

To clear symbols from a square, hover over the square with the mouse and hit **Del** or **Backspace** on the keyboard or click with the right mouse button on the square.

Notice that the squares change color while you hover the mouse over them. This is to help you keep up with the rules of KSudoku. Use the vertical and horizontal lines to check if the symbol you are about to enter into a vacant spot is already in use anywhere in the vertical or horizontal line that square is a part of. The coloring also highlights the block which, if you remember, must

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also contain only one instance of each symbol. If you do not need the highlighting, you can use the **Settings** → **Configure KSudoku...** menu item to turn it off.

Keep entering symbols in accordance with the rules until the whole game field is filled up. At this point KSudoku will check if all the entries are valid and will either correct you or accept your solution.

## Chapter 3

# Game Rules, Strategies and Tips

### 3.1 General Game Rules

The rules of KSudoku are quite simple.

- Depending on the size of the game board, the type of puzzle and the difficulty level chosen an individual KSudoku puzzle may take from a few minutes to a few hours to solve.
- Each square may hold one and only one symbol.
- Each horizontal row (as defined by the game board) can contain each symbol exactly once.
- Each vertical column (as defined by the game board) can contain each symbol exactly once.
- Each block (as defined by the game board) can contain each symbol exactly once

**NOTE:**

The set of symbols depends on the size of game you choose.

- Knowledge of mathematics or language is not required to solve KSudoku puzzles, but a little ability with arithmetic is needed in Killer Sudoku and Mathdoku puzzles.
- The symbols already on the game board when the puzzle starts cannot be changed.
- You can only modify the symbols you have previously entered.
- Puzzles generated by KSudoku have one solution only.
- Puzzles you enter in might have no solution or more than one solution, but if they are from a published source this probably means you have made a data-entry error.

### 3.2 KSudoku Variations

#### 3.2.1 Sudoku Puzzles

- The Standard 9x9 Sudoku puzzle has 9 rows, 9 columns and 9 square blocks of size 3x3.
- Other sizes of Standard Sudoku are 4x4 (very easy), 16x16 and 25x25 (not so easy).



- The Jigsaw and Aztec variations are the same as Standard 9x9 Sudoku except that some blocks are not square.
- The XSudoku variation is exactly the same as Standard Sudoku with an additional requirement: the two main diagonals must also each contain the symbols 1 to 9 once and once only. KSudoku highlights the diagonals to make this easier to see.
- The Nonomino 9x9, Pentomino 5x5 and Tetromino 4x4 variations are the same as a Standard Sudoku except that some blocks are not square.
- The 6x6 variation is the same as a Standard Sudoku except that the blocks are six 3x2 rectangles.

### 3.2.2 Samurai Puzzles

- The Samurai Sudoku consists of five Standard Sudoku puzzles of 9x9 squares each, overlapping at the corners by four 3x3 blocks. Each of the five puzzles has 9 rows, 9 columns and 9 blocks to solve and the symbols in the overlapping squares must fit into the solutions of two Standard 9x9 Sudokus.
- The Tiny Samurai Sudoku contains five 4x4 Sudoku puzzles, overlapping at the corners by four squares. Each of the five puzzles has 4 rows, 4 columns and 4 blocks to solve.
- The Windmill variation consists of five Standard 9x9 Sudoku puzzles, overlapping at the corners by two 3x3 blocks. It is like a Samurai Sudoku, but the central 9x9 Sudoku is harder to see. Eight of its 3x3 blocks are shared with the sails of the windmill and only the central 3x3 block is not.
- The Sohei variation is another Samurai type and has four 9x9 Sudoku puzzles, overlapping at two corners by a 3x3 block. The central 3x3 block of the puzzle is empty.

### 3.2.3 Roxdoku 3D Puzzles

- The Roxdoku variants are based on cubes in three dimensions, but are easier than they sound. There are no rows or columns. A 3x3x3 Roxdoku puzzle has 27 small cubes arranged into a larger 3x3x3 cube. This contains nine slices, each containing 3x3 small cubes, and these are the square blocks that must be filled with the numbers 1 to 9. A 4x4x4 Roxdoku has twelve 4x4 slices and a 5x5x5 Roxdoku has fifteen 5x5 slices.
- The Roxdoku Twin variant has two 3x3x3 Roxdoku puzzles sharing a corner. The corner piece must be part of the solution of both 3x3x3 cubes.
- The Double Roxdoku variant contains two 3x3x3 Roxdoku puzzles sharing three pieces along an edge. The edge pieces must be part of the solution of both 3x3x3 cubes.
- The Samurai Roxdoku variant has nine 3x3x3 Roxdoku puzzles. One is at the center and the other eight 3x3x3 cubes overlap it, one at each of the central cube's corners. Those corner pieces must each be part of the solution of two 3x3x3 cubes.

### 3.2.4 Killer and Mathdoku Variations

- Killer puzzles have two variants: Tiny Killer (4x4) and Killer Sudoku (9x9). They both have rows, columns and square blocks, exactly as in Standard Sudoku puzzles and following exactly the same rules. They also have irregularly shaped areas called cages, where each cage's digits must add up to the number in small type in the corner of the cage and no digit can be repeated within the cage. Typically the puzzle starts with only a few squares containing symbols. You need to use arithmetic and the usual Sudoku rules together to work out the solution. The screen graphics make it difficult to visualize the square blocks that are present, but they are easier to see if you print the puzzle, using the **Game** → **Print...** menu item.

- Mathdoku variants, also known as Kenken™, have no blocks, only row and column restrictions, and have cages where the digits must add, subtract, divide or multiply according to the values and arithmetical symbols in small type in their corners. A digit in a Mathdoku cage can be repeated, but not in the same column or row. For example, an L-shape of three squares with a requirement 5+ can have solutions 1 3 1 or 2 1 2, provided the ones or twos are not in the same row or column as each other. Note that subtraction and division cages always have two squares and the two digits of the solution can appear in either order. For example, a 2-cage could have solutions 1 3 or 3 1 or 2 4 or 4 2, etc.
- Because there are no blocks in a Mathdoku puzzle, it can have any size from 3x3 up to 9x9, with the default being 6x6. See the [Game Configuration](#) section for details. To get you started, there is a variant called Mathdoku 101 of size 4x4.

### 3.3 Strategies and Tips

- Take your time and do not rush. KSudoku is not a quick game.
- Pay attention to the row, column, and block colorings. They are there to help you.
- Make sure that no duplicate symbol exists already in the row, column or block where you are entering a symbol.
- If in doubt, try to foresee if a square you are entering a symbol into may be needed by some other symbol, which otherwise cannot go anywhere else due to the row, column and block rules.
- Use the Internet to search for general hints and strategies for solving Sudoku puzzles.
- Use marker moves when you spot a square or squares that have just a few alternatives but you cannot decide between them immediately. Markers will save you time and memory effort later, when more squares have been filled in. See [How to Play](#) for details of how to use markers.
- If you are having trouble, try to retrace your steps and see exactly where you have made an error. You can use the **Move** → **Undo** and **Move** → **Redo** menu items, repeatedly if necessary, and there is a setting in **Settings** → **Configure KSudoku...** that highlights errors.
- Even though KSudoku provides a 'Hint' option for you, try not to use it often. Remember, solving the puzzle all by yourself enhances your brain activity, while using the 'Hint' feature too often is cheating.
- If you have too much trouble solving a certain puzzle and simply must use the 'Hint' feature, then maybe you should try decreasing the difficulty level, or try a simpler, more basic puzzle.
- Some puzzle layouts feature very specific game board shapes. It is a good idea to have the highlighting option enabled even if you consider yourself an experienced player.

## Chapter 4

# Interface Overview

### 4.1 The Welcome Screen

The Welcome Screen is the first thing you see when you start KSudoku or use the toolbar or menu to request a new game. It has a list of all the puzzle types and sizes and you can click on one of them to make a selection.

If you click the button marked **Enter In A Puzzle**, an empty board of the selected type and size appears. Here you can use the mouse or keyboard to enter in a puzzle from another source, such as a newspaper. When you have finished, use the **Check** action, on toolbar or menu, to check the puzzle. It should have just one solution. If so, you can start solving the puzzle or perhaps get KSudoku to solve it. If there is no solution or more than one solution, it probably means you have made a data-entry error somewhere.

If you click the button marked **Generate A Puzzle**, KSudoku will display a board with some squares already filled in. It is up to you to fill in the rest.

Before you generate a puzzle, check that the settings of the **Difficulty:** and **Symmetry:** drop down boxes are to your liking. You can change them during a game, but then they will have no effect until the next puzzle is generated.

#### NOTE

If you cannot see the **Difficulty:** and **Symmetry:** drop down boxes, use the **Settings** → **Show Statusbar** menu item to make sure that the statusbar is visible.

The **Difficulty:** drop down box provides six levels of difficulty, from **Very Easy** up to **Hard**, **Diabolical** and **Unlimited**. The easier levels may take a few minutes to solve on a 9x9 board. The **Hard** and **Diabolical** levels may take an hour or so and are intended to be equivalent to difficult grades appearing in newspapers. Samurai puzzles and 16x16 or 25x25 sizes of puzzles will take longer to solve, simply because there are more rows, columns and blocks and more squares to fill in.

The **Diabolical** level typically requires one or more guesses, with backtracking if you guess wrong. Lower levels can usually be solved by logic alone. The **Unlimited** level has no limits on the number of guesses required, how soon the first guess is needed or how complex the logic might be. It is provided for the interest of expert players, but tends to generate uninteresting 'inhuman' puzzles and is not recommended for general use.

The **Symmetry:** drop down box provides seven types of symmetry, including **No Symmetry**. This controls the layout and appearance of the squares that are filled in at the start of a puzzle and has mainly aesthetic effect, except that puzzles with no symmetry tend to be slightly harder than those with high symmetry and it is less likely that KSudoku can generate a puzzle with high difficulty and high symmetry combined.

## 4.2 The Game Menu

**Game → New (Ctrl+N)**

Starts a new game.

**Game → Load... (Ctrl+O)**

Loads a saved game.

**Game → Save (Ctrl+S)**

Saves the current game as a default save file.

**Game → Save As...**

Saves the current game as a file of your choice.

**Game → Print... (Ctrl+P)**

Prints the current state of a two-dimensional game on a printer of your choice. The block outlines and original puzzle values are printed in black. Other cells, filled-in values and solution values are printed in gray. There is an option to print just one puzzle or more than one puzzle per page. See [Game Configuration](#).

**Game → Quit (Ctrl+Q)**

Quits KSudoku.

## 4.3 The Move Menu

**Move → Undo (Ctrl+Z)**

Undo your last move, repeatedly if required.

**Move → Redo (Ctrl+Shift+Z)**

Redo a move that was undone, repeatedly if required.

**Move → Hint (H)**

Give a Hint by filling in a vacant square.

**Move → Solve**

Instantly solve the puzzle.

**Move → Check**

Check an entered puzzle for validity. If it has only one solution, it becomes available for play. If it has no solution or more than one solution, there has probably been an error in the data-entry.

## 4.4 The Settings Menu

**Settings → Configure KSudoku...**

Open a dialog to configure KSudoku. See [Game Configuration](#) section for details.

Additionally KSudoku has the common KDE **Settings** and **Help** menu items, for more information read the sections about the [Settings Menu](#) and [Help Menu](#) of the KDE Fundamentals.

## Chapter 5

# Frequently asked questions

1. *I want to change the way this game looks. Can I?*

Sudoku games are traditionally played using a square grid. Themes do not make much sense here, but you can select some color schemes and backgrounds. To do so use **Settings** → **Configure KSudoku...** on the menubar.

2. *Can I use the keyboard to play this game?*

Yes. In KSudoku keyboard play is always enabled. Please use the cursor keys to move the selection, numeric or alphabetic characters to enter the symbols and the **Shift** key to apply markers.

3. *Where are the high scores?*

KSudoku does not have this feature.

## Chapter 6

# Game Configuration

### 6.1 Game Options

#### **When printing, try to fit more than one puzzle on a page**

Toggle the option to print more than one puzzle per page whenever they will fit.

If this option is checked, puzzles will be printed when no more will fit on a page or when KSudoku terminates. Otherwise a puzzle is printed immediately.

Three-dimensional puzzles cannot be printed.

#### **Show Highlights in 2-D puzzles**

Toggle the KSudoku highlight option for two-dimensional puzzles.

#### **Show Errors**

Toggle the option to highlight errors.

#### **Show Highlights in 3-D puzzles**

Toggle the KSudoku highlight option for three-dimensional puzzles.

#### **Mathdoku puzzle size (3-9)**

Choose a size for Mathdoku puzzles, from 3 (very easy) to 9 (very hard) with size 6 being the default.

#### **Settings for 3-D Puzzles Only**

These five settings adjust the highlighting and visibility of cells in three-dimensional puzzles. The idea is to make it easier to see relationships between cells, especially if they are behind other cells.

**NOTE:**

Having the highlighting options enabled is recommended even for the most experienced players, as it helps you see the actual game board constraints.

## Chapter 7

# Credits and License

KSudoku

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