

killersudoku.sty

v1.0

**A style file for typesetting Killer Sudoku
logic puzzles**

⁷	⁶	⁵	
			⁶
⁷			
	⁹		

⁷ 3	⁶ 2	⁵ 4	1
4	1	3	⁶ 2
⁷ 2	4	1	3
1	⁹ 3	2	4

April 11, 2013

Package author:
Josef Kleber

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1 The puzzle

Fill the cells with the numbers from 1 to SIZE of the puzzle. The numbers may occur only once in each row, column and colored area if specified. In the top left corner of a framed area, you will find the sum of the entered numbers. The numbers of an area may not necessarily be different, when they are in different rows or columns. But they must be different, when additional colored areas are specified. Here's a little self-explanatory example:

7	6	5	
			6
7			
	9		

7	6	5	
3	2	4	1
4	1	3	6
7			
2	4	1	3
1	9	3	2
			4

```

1 \begin{killersudoku}
2   \framearea{black}{\tikzpath{1}{1}{8,8,6,6,2,4,2,4}}
3   \framearea{black}{\tikzpath{1}{3}{8,8,6,2,2,4}}
4   \framearea{black}{\tikzpath{2}{1}{8,6,6,6,2,4,4,4}}
5   \framearea{black}{\tikzpath{2}{3}{8,8,6,2,6,2,4,4}}
6   \framearea{black}{\tikzpath{3}{2}{8,6,8,6,2,2,4,4}}
7   \framearea{black}{\tikzpath{3}{4}{8,6,6,2,4,4}}
8   \begin{puzzlebackground}
9     \colorarea{orange!20}{\tikzpath{1}{1}{8,8,6,6,2,2,4,4}}
10    \colorarea{orange!20}{\tikzpath{3}{3}{8,8,6,6,2,2,4,4}}
11  \end{puzzlebackground}
12  \setrule{1}{2}{7}
13  \setrule{1}{4}{7}
14  \setrule{2}{1}{9}
15  \setrule{2}{4}{6}
16  \setrule{3}{4}{5}
17  \setrule{4}{3}{6}
18 \end{killersudoku}
19 \hspace{1.5cm}
20 \begin{killersudoku}
21   \framearea{black}{\tikzpath{1}{1}{8,8,6,6,2,4,2,4}}
22   \framearea{black}{\tikzpath{1}{3}{8,8,6,2,2,4}}
23   \framearea{black}{\tikzpath{2}{1}{8,6,6,6,2,4,4,4}}
24   \framearea{black}{\tikzpath{2}{3}{8,8,6,2,6,2,4,4}}
25   \framearea{black}{\tikzpath{3}{2}{8,6,8,6,2,2,4,4}}

```

```

26 \framearea{black}{\tikzpath{3}{4}{8,6,6,2,4,4}}
27 \begin{puzzlebackground}
28 \colorarea{orange!20}{\tikzpath{1}{1}{8,8,6,6,2,2,4,4}}
29 \colorarea{orange!20}{\tikzpath{3}{3}{8,8,6,6,2,2,4,4}}
30 \end{puzzlebackground}
31 \setrule{1}{2}{7}
32 \setrule{1}{4}{7}
33 \setrule{2}{1}{9}
34 \setrule{2}{4}{6}
35 \setrule{3}{4}{5}
36 \setrule{4}{3}{6}
37 \setrow{4}{3,2,4,1}
38 \setrow{3}{4,1,3,2}
39 \setrow{2}{2,4,1,3}
40 \setrow{1}{1,3,2,4}
41 \end{killersudoku}

```

2 Options

rows [5] defines the number of rows in the grid.

columns [5] specifies the number of columns in the grid

width [5.1cm] sets the width of the minipage, in which the grid is typeset.

scale [1] scales the size of the grid in the minipage.

fontsize [Large] specifies the size of the numbers next to the grid. Here, the usual L^AT_EX sizes are used. Possible values: tiny, scriptsize, footnotesize, small, normalsize, large, Large, LARGE, huge, Huge

title [] sets the title of a puzzle.

titleindent [0cm] defines the indent of the title.

titlewidth [5.1cm] specifies the width of the box the title is set in.

bgcolor [] sets the background color of the grid.

counterstyle [none] defines the counter style. Predefined styles: none, left, right

cvoffset [-23pt] sets the vertical offset of the counters in the margin.

3 Environments

3.1 killersudoku

```

\begin{killersudoku}[\langle options \rangle]
...
\end{killersudoku}

```

The killersudoku environment is the central core of the style file. With the optional argument of the environment, you can reset the options with local scope. Here, a blank grid is created.

3.2 puzzlebackground

`\begin{puzzlebackground}`
`...`
`\end{puzzlebackground}` The `puzzlebackground` environment allows you to place elements behind the main layer. This is for example usefull for the `\fillarea` command.

3.3 puzzleforeground

`\begin{puzzleforeground}`
`...`
`\end{puzzleforeground}` The `puzzleforeground` environment allows you to place elements in front of the main layer. This is for example usefull for the `\framearea` command.

4 Commands

4.1 In the grid and around

4.1.1 killersudokucell

`\killersudokucell`
`{\langle column \rangle}{\langle row \rangle}{\langle number \rangle}` The command `\killersudokucell` sets the $\langle number \rangle$ of the grid cell $\langle column \rangle$ $\langle row \rangle$.

4.1.2 setrow

`\setrow{\langle row \rangle}{\langle csv list \rangle}` The command `\setrow` sets the contents of $\langle row \rangle$. It expects a comma-separated list.

4.1.3 setcolumn

`\setcolumn{\langle column \rangle}{\langle csv list \rangle}` The command `\setcolumn` sets the contents of $\langle column \rangle$.

4.1.4 setrule

`\setrule{{\langle column \rangle}{\langle row \rangle}}`
`{\langle rule \rangle}` With the `\setrule` command, you can set a calculation rule $\langle rule \rangle$ into the top left corner of cell $\langle column \rangle$ $\langle row \rangle$. The rule is typeset in inline math mode. You might consider using the `\times` and `\div` commands.

4.1.5 framearea

`\framearea{\langle color \rangle}{\langle tikz path \rangle}` The command `\framearea` frames the area given by $\langle tikz path \rangle$ with color $\langle color \rangle$. The reference for coordinates is the bottom left corner of the cell.

```
1 \framearea{green}{(2,2)--(2,3)--(3,3)--(3,2)--(2,2)}
```

This command will color the frame of the grid cell (2,2) green. You should consider using this command in the `puzzleforeground` environment.

4.1.6 colorarea

`\colorarea{\langle color \rangle}{\langle tikz path \rangle}` The command `\colorarea` fills the area given by $\langle tikz path \rangle$ with color $\langle color \rangle$, but without frame. The reference for coordinates is the bottom left corner of the cell. You should consider using this command in the `puzzlebackground` environment.

4.1.7 tikzpath

`\tikzpath{[column]}{[row]}{[csv list]}` With the `\tikzpath` command, you can easily construct a `\tikz` path. You just need to define a starting point *column*/*row* (bottom left corner) and a *csv list* with direction indicators relative to the current position.

7: up left	8: up	9: up right
4: left	5: no change	6: right
1: down left	2: down	3: down right

```
1 \framearea{green}{\tikzpath{2}{2}{8,6,2,4}}
```

This command will frame grid cell (2,2) green.

4.2 Presentation

4.2.1 definecounterstyle

`\definecounterstyle{<name>}{<definition>}` The command `\definecounterstyle` allows you to define your own styles. For example, the style `left` is defined as follows:

```
1 \definecounterstyle{left}{
2   \begingroup\reversemarginpar\marginnote{
3     \tikz\node[shape=rectangle,fill=yellow!40,inner sep=7pt,
4       draw,rounded corners=3pt,thick]
5     {\Huge\puzzlecounter};}[\LP@cwoffset]\endgroup
6 }
```

To typeset the counter into the margin we use the command `\marginnote`. We need to use the command `\reversemarginpar` to set the counter into the left margin. Of course, we must use this command in a group for local scope. Finally we use `\puzzlecounter` in a `\tikz` node with a vertical offset set with the option `cvoffset`.

4.2.2 puzzlecounter

`\puzzlecounter` The command `\puzzlecounter` provides the counter in textual form to use it for example in `\definecounterstyle`.

4.2.3 titleformat

`\titleformat{<format>}` With the command `\titleformat`, you can define the format of the title. By default, the definition is as follows:

```
1 \titleformat{\centering\Large\color{blue}}
```

4.3 Miscellaneous

4.3.1 killersudokusetup


`\killersudokusetup{<options>}` With the command `\killersudokusetup` you can reset the options with global scope.

4.3.2 setpuzzlecounter

`\setpuzzlecounter{<number>}` With the command `\setpuzzlecounter`, you can reset the puzzle counter, for example before the solutions.



5 Examples & Solutions

You can download application examples and their solutions from the [project page](#). The puzzles are originally licensed under .