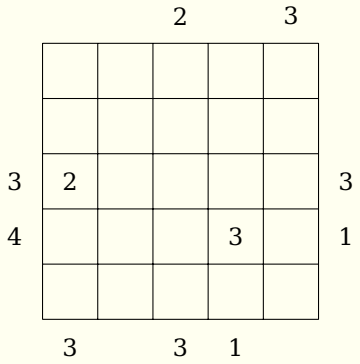
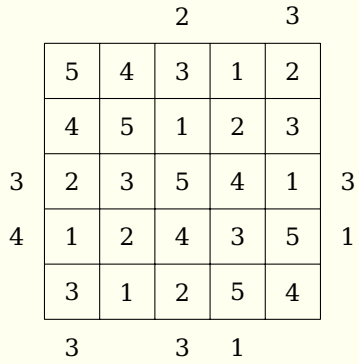
skyline.sty

v1.1

A style file for typesetting Skyline logic puzzles





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Package author:
Josef Kleber

josef.kleber@gmx.de
https://bitbucket.org/kleberj/logicpuzzle/

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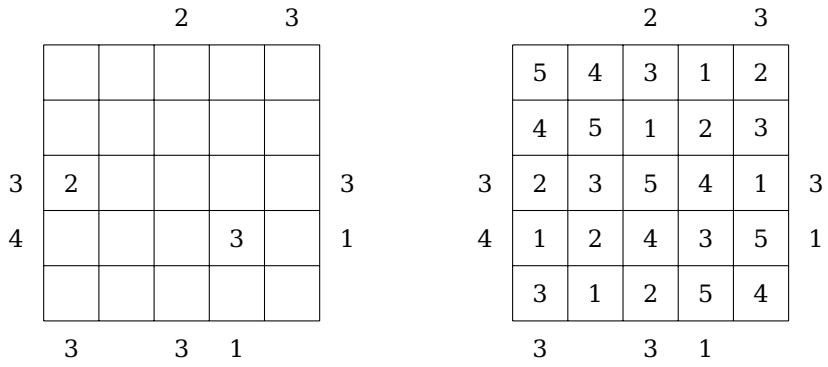
1 The puzzle

There are skyscrapers located in each cell. Try to find out the height of the skyscraper in the respective cell. There are heights of 1 to MAX in every row, every column, and in each of the two diagonals if indicated. Some cells may be empty (parks). The numbers around the grid indicate how many buildings you can see from this position when you look at the skyscraper lineup. Bear in mind that only those skyscrapers are visible which are higher than the ones in front. Here's a little self-explanatory example:




```
\begin{center}
  \begin{skyline}
    \skylineB{3,{},3,1,{}}
    \skylineL{{},4,3,{},{}}
    \skylineT{{},{},2,{},3}
    \skylineR{{},1,3,{},{}}
    \skylinecell{1}{3}{2}
    \skylinecell{4}{2}{3}
  \end{skyline}
  \hspace{1cm}
  \begin{skyline}
    \skylineB{3,{},3,1,{}}
    \skylineL{{},4,3,{},{}}
    \skylineT{{},{},2,{},3}
    \skylineR{{},1,3,{},{}}
    \setrow{5}{5,4,3,1,2}
    \setrow{4}{4,5,1,2,3}
    \setrow{3}{2,3,5,4,1}
    \setrow{2}{1,2,4,3,5}
    \setrow{1}{3,1,2,5,4}
  \end{skyline}
\end{center}
```

2 Options

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

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

sudoku [false] sets rows and columns to 9, in case of ⟨*true*⟩ is specified. Additionally the classic Sudoku grid is drawn.

width [6.7cm] 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 LaTeX sizes are used. Possible values: tiny, scriptsize, footnotesize, small, normalsize, large, Large, LARGE, huge, Huge

title [] sets the title of a puzzle.

titleindent [0.75cm] defines the indent of the title.

titlewidth [5.85cm] 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 [-38pt] sets the vertical offset of the counters in the margin.

3 Environments

3.1 skyline

\begin{skyline}[⟨*options*⟩]
...
\end{skyline}

The skyline 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 skylineT

\skylineT{⟨*csv list*⟩}

The command \skylineT typesets the numbers above the grid indicating how many skycrapers are visible. It expects a comma-separated list as an argument.

4.1.2 skylineB

`\skylineB{`⟨*csv list*⟩`}` The command `\skylineB` typesets the numbers below the grid.

4.1.3 skylineL

`\skylineL{`⟨*csv list*⟩`}` The command `\skylineL` typesets the numbers left to the grid.

4.1.4 skylineR

`\skylineR{`⟨*csv list*⟩`}` The command `\skylineR` typesets the numbers right to the grid.

4.1.5 skylinecell

`\skylinecell{`⟨*column*⟩`}{`⟨*row*⟩`}{`⟨*height*⟩`}` The command `\skylinecell` sets the ⟨*height*⟩ of the grid cell ⟨*column*⟩⟨*row*⟩.

4.1.6 setrow

`\setrow{`⟨*row*⟩`}{`⟨*csv list*⟩`}` The command `\setrow` sets the heights of ⟨*row*⟩. It expects a comma-separated list.

4.1.7 setcolumn

`\setcolumn{`⟨*column*⟩`}{`⟨*csv list*⟩`}` The command `\setcolumn` sets the heights of ⟨*column*⟩.

4.1.8 framearea

`\framearea{`⟨*color*⟩`}{`⟨`\`*tikz path*⟩`}` The command `\framearea` frames the area given by ⟨`\`*tikz path*⟩ with color ⟨*color*⟩. 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.

4.1.9 fillarea

`\fillarea{`⟨*color*⟩`}{`⟨`\`*tikz path*⟩`}` The command `\fillarea` fills the area given by ⟨`\`*tikz path*⟩ with color ⟨*color*⟩. The reference for coordinates is the bottom left corner of the cell. You should consider using this command in the `puzzlebackground` environment.

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:

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

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:

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

4.3 Miscellaneous

4.3.1 skylinesetup

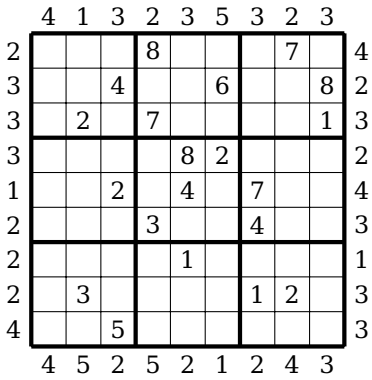
`\skylinesetup{`⟨*options*⟩`}` With the command `\skylinesetup` you can reset the options with global scope.

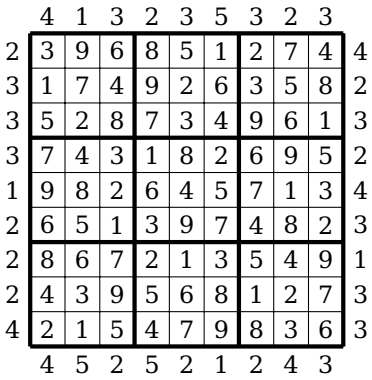
4.3.2 setpuzzlecounter

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

5 Supported variants

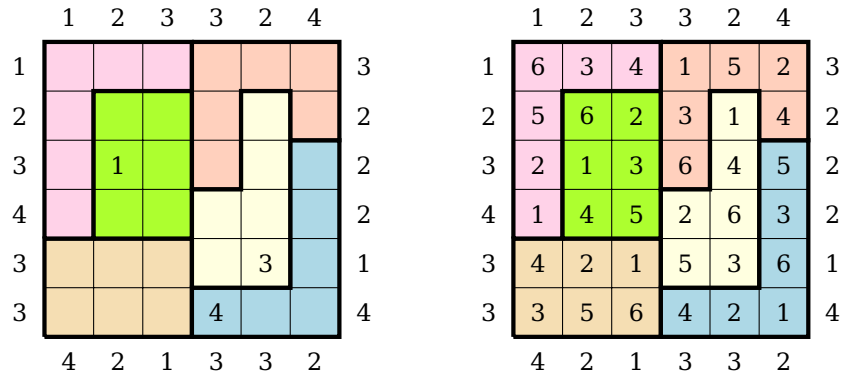
5.1 Skyline Sudoku






```
\begin{center}
  \begin{skyline}[sudoku,scale=.46]
    \skylineB{4,5,2,5,2,1,2,4,3}
    \skylineL{4,2,2,2,1,3,3,3,2}
    \skylineT{4,1,3,2,3,5,3,2,3}
    \skylineR{3,3,1,3,4,2,3,2,4}
    \setrow{9}{{},{},{},8,{},{},{},7}
    \setrow{8}{{},{},4,{},{},6,{},{},8}
    \setrow{7}{{},2,{},7,{},{},{},{},1}
    \setrow{6}{{},{},{},{},8,2}
    \setrow{5}{{},{},2,{},4,{},7}
    \setrow{4}{{},{},{},3,{},{},4}
    \setrow{3}{{},{},{},{},1}
    \setrow{2}{{},3,{},{},{},{},1,2}
    \setrow{1}{{},{},5}
  \end{skyline}
  \hspace{1cm}
  \begin{skyline}[sudoku,scale=.46]
    \skylineB{4,5,2,5,2,1,2,4,3}
    \skylineL{4,2,2,2,1,3,3,3,2}
    \skylineT{4,1,3,2,3,5,3,2,3}
    \skylineR{3,3,1,3,4,2,3,2,4}
    \setrow{9}{3,9,6,8,5,1,2,7,4}
    \setrow{8}{1,7,4,9,2,6,3,5,8}
    \setrow{7}{5,2,8,7,3,4,9,6,1}
    \setrow{6}{7,4,3,1,8,2,6,9,5}
    \setrow{5}{9,8,2,6,4,5,7,1,3}
    \setrow{4}{6,5,1,3,9,7,4,8,2}
    \setrow{3}{8,6,7,2,1,3,5,4,9}
    \setrow{2}{4,3,9,5,6,8,1,2,7}
    \setrow{1}{2,1,5,4,7,9,8,3,6}
  \end{skyline}
\end{center}
```

5.2 Skyline Sudoku (N*N)




```
\begin{center}
  \begin{skyline}[rows=6,columns=6,scale=.65]
    \skylineB{4,2,1,3,3,2}
    \skylineL{3,3,4,3,2,1}
    \skylineT{1,2,3,3,2,4}
    \skylineR{4,1,2,2,2,3}
    \skylinecell{2}{4}{1}
    \skylinecell{4}{1}{4}
    \skylinecell{5}{2}{3}
    \begin{puzzlebackground}
      \fillarea{Wheat}{(1,1)--(1,3)--(4,3)--(4,1)--(1,1)}
      \fillarea{HotPink!30}{(1,3)--(1,7)--(4,7)--(4,6)--(2,6)--(2,3)--(1,3)}
      \fillarea{GreenYellow}{(2,3)--(2,6)--(4,6)--(4,3)--(2,3)}
      \fillarea{LightBlue}{(4,1)--(7,1)--(7,5)--(6,5)--(6,2)--(4,2)--(4,1)}
      \fillarea{LightSalmon!50}{(4,7)--(4,4)--(5,4)--(5,6)--(6,6)--(6,5)--(7,5)
                                --(7,7)--(4,7)}
      \fillarea{LightYellow}{(4,2)--(4,4)--(5,4)--(5,6)--(6,6)--(6,2)--(4,2)}
    \end{puzzlebackground}
  \end{skyline}
  \hspace{1cm}
  \begin{skyline}[rows=6,columns=6,scale=.65]
    \skylineB{4,2,1,3,3,2}
    \skylineL{3,3,4,3,2,1}
    \skylineT{1,2,3,3,2,4}
    \skylineR{4,1,2,2,2,3}
    \setrow{6}{6,3,4,1,5,2}
    \setrow{5}{5,6,2,3,1,4}
    \setrow{4}{2,1,3,6,4,5}
    \setrow{3}{1,4,5,2,6,3}
    \setrow{2}{4,2,1,5,3,6}
    \setrow{1}{3,5,6,4,2,1}
    \begin{puzzlebackground}
      \fillarea{Wheat}{(1,1)--(1,3)--(4,3)--(4,1)--(1,1)}
      \fillarea{HotPink!30}{(1,3)--(1,7)--(4,7)--(4,6)--(2,6)--(2,3)--(1,3)}
      \fillarea{GreenYellow}{(2,3)--(2,6)--(4,6)--(4,3)--(2,3)}
      \fillarea{LightBlue}{(4,1)--(7,1)--(7,5)--(6,5)--(6,2)--(4,2)--(4,1)}
      \fillarea{LightSalmon!50}{(4,7)--(4,4)--(5,4)--(5,6)--(6,6)--(6,5)--(7,5)
                                --(7,7)--(4,7)}
      \fillarea{LightYellow}{(4,2)--(4,4)--(5,4)--(5,6)--(6,6)--(6,2)--(4,2)}
    \end{puzzlebackground}
  \end{skyline}
\end{center}
```

6 Examples & Solutions

You can download application examples and their solutions from the project page. The puzzles are originally licensed under CC BY NC SA.