diagbox Package (v2.0)

⇒ 中文版

Making Table Heads with Diagonal Lines

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1 Introduction

diagbox is a replacement of old slashbox package¹. I write this package simply because that slashbox is not available in TEX Live for licening problems. slashbox has no explicit license information available, but diagbox is under LPPL.

diagbox is a modern alternative of slashbox. I changed the user interface to use a key-value syntax, get rid of some restrictions of slashbox, use pict2e to draw diagonal lines. Especially, this package also provides ability to make a box with two diagonal lines in it. All these can be obtained by a \diagbox command.

As a replacement of slashbox, diagbox package also provides compatible macros of slashbox, but the result is a little different.

To use diagbox, ε -T_FX is needed. And diagbox requires pict2e, keyval and fp packages.

2 Usage

2.1 Basic usage

To load the package, just put this in the preamble:

\usepackage{diagbox}

\diagbox

\diagbox is the main command. It can take two arguments, to produce a box with a diagonal line from north west to south east.

¹By Koichi Yasuoka and Toru Sato. Available on CTAN://macros/latex/contrib/slashbox/slashbox.sty

For example:

Day Time	Mon	Tue	Wed
Morning	used	used	
Afternoon		used	used

```
begin{tabular}{|l|ccc|}

hline

diagbox{Time}{Day} & Mon & Tue & Wed \\

hline

morning & used & used & \\
Afternoon & & used & used \\
hline

hline

end{tabular}
```

\diagbox can also take three arguments, to draw a table head with two diagbox lines. For example,

```
begin{tabular}{|||ccc|}

hline

diagbox{Time}{Room}{Day} & Mon & Tue & Wed \\

hline

Morning & used & used & \\
Afternoon & & used & used \\
hline

hline

end{tabular}
```

Room Day Time	Mon	Tue	Wed
Morning	used	used	
Afternoon		used	used

2.2 More options

\diagbox can take a key-value list as an optional argument to specify the width and height of the box, the direction of the diagonal line, and the trimming margins:

width Specify the width of the box explicitly. If it is omitted, package will calculate a width automatically.

height Specify the height of the box explicitly. If it is omitted, package will calculate a height automatically.

dir Specify the direction of the diagonal line. The value can be NW, NE, SW and SE. Default value is NW. The meaning of the values see below.

• \diagbox[dir=\langle direction \rangle] {A}{B} in a table looks:

NW or SE:

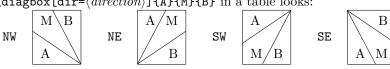
A

SW or NE:

A

B

• \diagbox[dir=\langle direction \rangle] {A}{M}{B} in a table looks:



В

trim Specify the margin to be trimmed. The value can be 1, r, and 1r, r1. This helps the slash line exceeds the boundary when $Q{}$ column specifier is used.

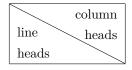
Here is a more complex example to show the usage of the options:

```
\begin{tabular}{|@{}1|c|c|r@{}|}
\hline
\diagbox[width=5em,trim=1]{Time}{Day} & Mon & Tue & Wed\\
\hline
Morning
          & used & used & used\\
\hline
Afternoon &
                 & used & \diagbox[dir=SW,height=2em,trim=r]{A}{B} \\
\hline
\end{tabular}
```

Day Time	Mon	Tue	Wed
Morning	used	used	used
Afternoon		used	A B

What's more, you can use \\ to break lines in \diagbox. Manual setting of the height of the head may be needed. For example,

```
\begin{tabular}{|c|}
\hline
\diagbox[height=45pt]{line\\heads}{column\\heads} \\
\hline
\end{tabular}
```



2.3Compatibility with slashbox

diagbox package emulates slashbox and also prevents slashbox to be loaded.

diagbox package provides \slashbox and \backslashbox which syntax similar to slashbox package. However, the results of the two packages are a little different. These two commands are for compatibility only, it is better to use \diagbox instead for new documents.

\backslashbox

\backslashbox works as \diagbox, but it takes two optional arguments to specify the

width and trim options.

\slashbox

\slashbox works as \diagbox[dir=SW], and takes two optional arguments to specify the width and trim options.

For example,

alpha num	A	В
1	A1	B1
2	A2	B2

```
begin{tabular}{|c|c|c|} \hline
backslashbox[2cm] {num}{alpha}
    & A & B \\hline
    1 & A1 & B1 \\hline
    2 & A2 & B2 \\hline
end{tabular}
```

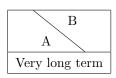
3 Known issues and TODO

Known issues:

• The result of \slashbox and \backslashbox is different with slashbox package. The algorithms to calculate the width and height are different; and the results of the second optional argument of \slashbox (i.e. trim key in \diagbox) in the two packages are different.

This is not a bug. Usually the width calculated by diagbox is more safe than slashbox.

• The cell with \diagbox should be the widest one of the column. Otherwise the slash line cannot exceeds the boundary. For example,



```
begin{tabular}{|c|} \hline
diagbox{A}{B} \\hline
Very long term \\hline
end{tabular}
```

This can be solved by setting a wider width option of \diagbox manually.

TODO:

• Improve the document of the source code. The algorithm of \diagbox@triple should be explained in detail. However, the explanations would be only available in Chinese, I'm sorry.

⇒ English Version

diagbox 宏包(v2.0) 制做斜线表头

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4 简介

diagbox 设计用来代替旧的 slashbox 宏包 1 。编写这个宏包的缘起是 slashbox 因为缺少明确的自由许可信息,被 $T_{\rm F}X$ Live 排除。这个宏包是在 LPPL 协议下发行的。

diagbox 是 slashbox 宏包的一个现代的版本。它采用了新的 key-value 式语法参数,去除了 slashbox 原有的一些长度限制,并调用 pict2e 宏包画斜线;特别还添加了绘制两条斜线的表头的新功能。

作为 slashbox 的代替,diagbox 除了提供自己的新命令,也提供了 slashbox 原有的两个命令,语法不变,编译结果略有区别。

diagbox 依赖 ε-T_EX 扩展(这在目前总是可用的),依赖 pict2e, keyval 和 fp 宏包。

5 用法说明

5.1 基本用法

要使用本宏包,首先在导言区调用:

\usepackage{diagbox}

\diagbox

\diagbox 是宏包提供的主要命令。它可以带有两个必选参数,表示要生成斜线表头的两部分内容。默认斜线是从西北到东南方向的。

¹作者 Koichi Yasuoka (安岡孝一) 与 Sato Toru (佐藤徹)。宏包见 CTAN://macros/latex/contrib/slashbox/slashbox.sty。

例如:

Day Time	Mon	Tue	Wed
Morning	used	used	
Afternoon		used	used

\diagbox 也可以接受三个参数,这样就会生成带有两条斜线的表头,例如:

```
begin{tabular}{|l|ccc|}

hline

diagbox{Time}{Room}{Day} & Mon & Tue & Wed \\

hline

morning & used & used & \\
Afternoon & & used & used \\
hline

hline

end{tabular}
```

Room Day Time	Mon	Tue	Wed
Morning	used	used	
Afternoon		used	used

5.2 更多参数设置

\diagbox 还可以在前面带一个可选参数,里面用 key-value 的语法设置宽度、方向等更多的选项:

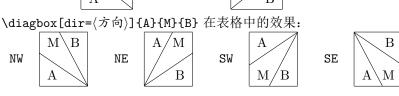
width 明确指定盒子的总宽度。如果省略,则会自动计算能够放下所有内容的宽度。

height 明确指定盒子的总高度。

dir 指定斜线方向。可以取 NW (西北)、NE (东北)、SW (西南)、SE (东南) 四种方向。在 只有一条斜线的表头中, NE 与 SW、SE 与 NW 是等价的。斜线方向的默认值是 NW。

 $\displaystyle \operatorname{diagbox}[\operatorname{dir}=\langle \sigma \sigma \rangle]\{A\}\{B\}$ 在表格中的效果:

NW 或 SE: A SW 或 NE: A B diagbox[dir=(方向)]{A}{M}{B} 在表格中的效



trim 设置左边界或右边界不计算额外的空白,可以取值为 1, r, lr 或 rl。这个选项在列格式包含 **0**{} 时将会有用。

一个更复杂的例子:

```
begin{tabular}{|@{}||c||c||r@{}|}

hline

diagbox[width=5em,trim=1]{Time}{Day} & Mon & Tue & Wed\\
hline

Morning & used & used \ used\\
hline

Afternoon & & used & \diagbox[dir=SW,height=2em,trim=r]{A}{B} \\
hline

end{tabular}
```

Day Time	Mon	Tue	Wed
Morning	used	used	used
Afternoon		used	A B

此外,\diagbox 的表头内容还可以用 \\ 手工换行。此时通常需要对自动计算的表头高度进行手工调整。例如:

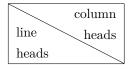
```
begin{tabular}{|c|}

hline

diagbox[height=45pt]{line\heads}{column\heads} \\

hline

end{tabular}
```



5.3 对 slashbox 宏包的兼容性

在使用 diagbox 宏包时,会模拟 slashbox 宏包的功能,并禁止 slashbox 再被调用。

diagbox 宏包提供了与 slashbox 大致相同的 \slashbox 与 \backslashbox 两个命令。 \slashbox 与 \backslashbox 的语法来自 slashbox 宏包,排版效果略有区别。这两个命令仅在旧文档中作为兼容命令使用。实际中使用 \diagbox 更为方便。

\backslashbox

\backslashbox 基本功能与 \diagbox 类似。它带有两个可选参数,分别表示 \diagbox 中的 width 与 trim 选项。

\slashbox

\slashbox 基本功能与 \diagbox[dir=SW] 类似。它也带有两个可选参数,表示 \diagbox 中的 width 和 tirm 选项。

例如:

alpha num	A	В
1	A1	В1
2	A2	B2

```
begin{tabular}{|c|c|c|} \hline
backslashbox[2cm] {num}{alpha}
  & A & B \\hline
  1 & A1 & B1 \\hline
  2 & A2 & B2 \\hline
  \end{tabular}
```

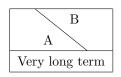
6 已知问题和未来版本

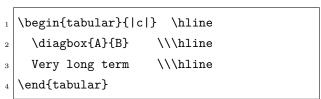
已知问题:

• \slashbox 与 \backslashbox 命令的效果与在 slashbox 宏包中不同。两个宏包在计算盒子宽度和高度时,使用了不同的算法;同时,在处理 \slashbox 第二个可选参数 (即 \diagbox 的 trim 键)时,使用的方式也不一样。

这不是 bug。通常 diagbox 计算出的宽度比 slashbox 的结果更安全一些。

• \diagbox 生成的单元格必须是表列中最宽的一个。如果不能达到最宽,则画出的斜 线不能保证在正确的位置。例如:





此时可以手工设置较宽的 \diagbox 的 width 选项,解决此问题。

未尽的工作:

• 源代码的文档需要改进。特别是在 \diagbox@triple 中的宽度和高度计算算法需要 详细说明。

7 Implementation / 代码实现

```
使用 key-value 界面。
 1 \RequirePackage{keyval}
绘图依赖 pict2e 宏包。
 2 \RequirePackage{pict2e}
计算依赖 fp 宏包。
 3 \RequirePackage[nomessages]{fp}
     分配用到的盒子寄存器。它们分别对应于 \diagbox 三个必选参数的内容。
 4 \newbox\diagbox@boxa
 5 \newbox\diagbox@boxb
 6 \newbox\diagbox@boxm
分配长度变量。
 7 \newdimen\diagbox@wd
 8 \newdimen\diagbox@ht
 9 \newdimen\diagbox@sepl
10 \newdimen\diagbox@sepr
     定义 \diagbox 的键值选项。
11 \define@key{diagbox}{width}{%
    \setlength{\diagbox@wd}{#1}}
13 \define@key{diagbox}{height}{%
     \setlength{\diagbox@ht}{#1}}
15 \define@key{diagbox}{trim}{%
    16
      \ifcsname diagbox@sep\@reserveda\endcsname
17
        \label{lem:condition} $$ \operatorname{diagbox@sep@reserveda\endcsname}_{\z0}\% $$
18
19
20
      \PackageError{diagbox}{Unknown trim option `#1'.}{1, r, lr and rl are supported.}%
      fi}
21
22 \define@key{diagbox}{dir}{%
    \def\diagbox@dir{#1}%
23
24
    \unless\ifcsname diagbox@dir@#1\endcsname
25
      \PackageError{diagbox}{Unknown direction `#1'.}{NW, NE, SW, SE are supported.}%
      \def\diagbox@dia{NW}%
26
    \fi}
28 \let\diagbox@dir@SE\relax
29 \let\diagbox@dir@SW\relax
30 \let\diagbox@dir@NE\relax
31 \let\diagbox@dir@NW\relax
这是带斜线的盒子本身。由一个 picture 环境实现。
32 \def\diagbox@pict{%
```

\diagbox@pict

\unitlength\p@

```
\begin{picture}
                      34
                          (\strip@pt\dimexpr\diagbox@wd-\diagbox@sepl-\diagbox@sepr\relax,\strip@pt\diagbox@ht)
                      35
                      36
                           (\strip@pt\diagbox@sep1,0)
                             \@nameuse{diagbox@\diagbox@part @pict@\diagbox@dir}
                      37
                         \end{picture}}
                      38
                     方向为 SE 的斜线盒子内容。
\diagbox@double@pict@SE
                      39 \def\diagbox@double@pict@SE{%
                         \put(\strip@pt\diagbox@wd,\strip@pt\diagbox@ht) {\makebox(0,0)[tr]{\box\diagbox@boxb}}
                         \Line(0,\strip@pt\diagbox@ht)(\strip@pt\diagbox@wd,0)}
                     方向 NW 与 SE 相同。
\diagbox@double@pict@NW
                      43 \let\diagbox@double@pict@NW\diagbox@double@pict@SE
                     方向为 NE 的斜线盒子内容。
\diagbox@double@pict@NE
                      44 \def\diagbox@double@pict@NE{%
                         \put(0,\strip@pt\diagbox@ht) {\makebox(0,0)[tl]{\box\diagbox@boxa}}
                         \put(\strip@pt\diagbox@wd,0) {\makebox(0,0)[br]{\box\diagbox@boxb}}
                         \Line(0,0)(\strip@pt\diagbox@wd,\strip@pt\diagbox@ht)}
                     方向 SW 与 NE 相同。
\diagbox@double@pict@NE
                      48 \let\diagbox@double@pict@SW\diagbox@double@pict@NE
                     分成两部分的盒子。三个参数,分别为 key-value 格式的可选项、左半边内容、右半边内
       \diagbox@double
                      容。这里的主要工作是读入参数并计算斜线盒子的大小。
                      49 \def\diagbox@double#1#2#3{%
                      50
                         \begingroup
                         \diagbox@wd=\z@
                      51
                         \displaystyle \frac{diagbox@ht=\z@}{}
                      52
                         \diagbox@sepl=\tabcolsep
                      53
                         \diagbox@sepr=\tabcolsep
                         \def\diagbox@part{double}%
                      55
                         \setkeys{diagbox}{dir=NW,#1}%
                      56
                         \setbox\diagbox@boxa=\hbox{%
                      57
                           58
                         \setbox\diagbox@boxb=\hbox{%
                           60
                         \ifdim\diagbox@wd=\z@
                      61
                      62
                           \ifdim\wd\diagbox@boxa>\wd\diagbox@boxb
                             \diagbox@wd=\dimexpr2\wd\diagbox@boxa+\diagbox@sepl+\diagbox@sepr\relax
                      63
                      64
                           \else
                      65
                             \diagbox@wd=\dimexpr2\wd\diagbox@boxb+\diagbox@sepl+\diagbox@sepr\relax
                           \fi
                      66
                      67
                         \fi
                         \ifdim\diagbox@ht=\z@
                      68
```

```
\diagbox@ht=\dimexpr\ht\diagbox@boxa+\dp\diagbox@boxa+\ht\diagbox@boxb+\dp\diagbox@boxb\relax
                    69
                       \fi
                    70
                    71
                       $\vcenter{\hbox{\diagbox@pict}}$%
                       \endgroup}
                    72
diagbox@triple@setbox@NW
                    73 \def\diagbox@triple@setbox@NW#1#2#3{%
                       \setbox\diagbox@boxa=\hbox{%
                    74
                         75
                       \setbox\diagbox@boxm=\hbox{%
                    76
                         77
                       \setbox\diagbox@boxb=\hbox{%
                    78
                         \begin{tabular}{@{}r@{}hspace{\diagbox@sepr}}} \# 3\end{tabular}} \\
                    79
diagbox@triple@setbox@SW
                    80 \let\diagbox@triple@setbox@SW\diagbox@triple@setbox@NW
diagbox@triple@setbox@NW
                    81 \def\diagbox@triple@setbox@SE#1#2#3{%
                       \setbox\diagbox@boxa=\hbox{%
                    82
                         83
                       \setbox\diagbox@boxm=\hbox{%
                    84
                         85
                       \setbox\diagbox@boxb=\hbox{%
                    86
                         \begin{tabular}{@{}r@{}hspace{\diagbox@sepr}}} \# 3\end{tabular}} \\
                    87
diagbox@triple@setbox@NE
                    88 \let\diagbox@triple@setbox@NE\diagbox@triple@setbox@SE
\diagbox@triple@pict@NW
                    89 \def\diagbox@triple@pict@NW{%
                                {\makebox(0,0)[bl]{\box\diagbox@boxa}}
                    90
                       \put(0,0)
                      \put(\x,\y) {\makebox(0,0)[tr]{\box\diagbox@boxb}}
                    92
                      \Line(0,\yym)(\x,0)
                    93
                       Line(\xm,\y)(\x,0)
\diagbox@triple@pict@NE
                    95 \def\diagbox@triple@pict@NE{%
                       \put(\x,\y) {\makebox(0,0)[tr]{\box\diagbox@boxm}}
                    97
                      \put(\x,0) {\makebox(0,0)[br]{\box\diagbox@boxb}}
                       \Line(0,0)(\xxm,\y)
                    99
                   100
                       Line(0,0)(x,\yym)
```

\diagbox@triple@pict@SW

```
101 \def\diagbox@triple@pict@SW{%
                         \put(0,\y) {\makebox(0,0)[t1]{\box\diagbox@boxa}}
                     102
                     103
                         \t(x,0) {\makebox(0,0)[br]{\box\diagbox@boxb}}
                     104
                         \Line(0,\ym)(\x,\y)
                     105
                         Line(\xm,0)(\x,\y)
                     106
\diagbox@triple@pict@SE
                     107 \def\diagbox@triple@pict@SE{%
                         \put(0.0)
                                    {\makebox(0,0)[bl]{\box\diagbox@boxa}}
                     108
                         109
                         \put(\x,\y) {\makebox(0,0)[tr]{\box\diagbox@boxb}}
                     110
                         \Line(0,\y)(\xm,0)
                     111
                         Line(0,y)(x,ym)
                     112
                     分成三部分的盒子。四个参数,分别为 kev-value 格式的可选项、左半边内容、中间内容、
    \diagbox@triplebox
                      右半边内容。
                     113 \def\diagbox@triple#1#2#3#4{%
                         \begingroup
                         \diagbox@wd=\z@
                     115
                         \diagbox@ht=\z@
                     116
                     117
                         \diagbox@sepl=\tabcolsep
                         \diagbox@sepr=\tabcolsep
                     118
                         \def\diagbox@part{triple}%
                     119
                         \setkeys{diagbox}{dir=NW,#1}%
                     120
                         121
                     取长宽
                         \edef\xa{\strip@pt\wd\diagbox@boxa}%
                     122
                         \edef\ya{\strip@pt\dimexpr\ht\diagbox@boxa+\dp\diagbox@boxa\relax}%
                     123
                         \edef\xb{\strip@pt\wd\diagbox@boxb}%
                     124
                         \edef\yb{\strip@pt\dimexpr\ht\diagbox@boxb+\dp\diagbox@boxb\relax}%
                     125
                         \edef\xm{\strip@pt\wd\diagbox@boxm}%
                     126
                         \edef\ym{\strip@pt\dimexpr\ht\diagbox@boxm+\dp\diagbox@boxm\relax}%
                     127
                      列方程, 求方程系数
                         \FPneg\bi\yb
                     128
                     129
                         \FPadd\ci\xb\xm \FPneg\ci\ci
                         \FPmul\di\xm\yb
                     130
                         \FPadd\bj\ya\ym \FPneg\bj\bj
                     131
                         \FPneg\cj\xa
                     132
                         \FPmul\dj\xa\ym
                     133
                      解方程
                         \FPsub\u\dj\di
                     134
                         \P v}{bj ci * bi cj * -}%
                     135
```

136

```
137
                     v u + copy * %
                     - 2 swap root}%
              138
              139
                   \ifdim\diagbox@wd=\z@
                     \Pupn{x}{2 \ bj \ bi - delta \ v \ u - + / /}%
              140
                     \diagbox@wd=\x\p@
              141
                   \else
              142
                     \edef\x{\strip@pt\diagbox@wd}%
              143
              144
                   \ifdim\diagbox@ht=\z@
              145
                     \Pupn{y}{2 cj ci - delta v u + - / /}%
              146
                     \diagbox@ht=\y\p@
              147
              148
                   \else
                     \edef\y{\strip@pt\diagbox@ht}%
              149
              150
                   \FPsub\xxm\x\xm
              151
                   \FPsub\yym\y\ym
              152
               画盒子
                   $\vcenter{\hbox{\diagbox@pict}}$%
              153
                   \endgroup}
     \diagbox 主要的用户命令。判断使用两部分还是三部分的盒子。
              155 \newcommand\diagbox[3][]{%
                   \@ifnextchar\bgroup
              156
                     {\displaystyle \{\diagbox@triple{#1}{#2}{#3}}{\diagbox@double{#1}{#2}{#3}}}
              157
                   以下代码用来模拟 slashbox 宏包的功能。
                   禁止读入 slashbox。
              158 \expandafter\xdef\csname ver@slashbox.\@pkgextension\endcsname{9999/99}99}
   \slashbox 模拟 \slashbox。
              159 \def\slashbox{%
              160
                   \def\diagbox@slashbox@options{dir=SW,}%
                   \slashbox@}
              161
\backslashbox 模拟 \backslashbox。
              162 \def\backslashbox{%
                   \def\diagbox@slashbox@options{dir=NW,}%
                   \slashbox@}
              164
   \slashbox@
              165 \newcommand\slashbox@[1][]{%
              166
                   \ifx\relax#1\relax\else
                     \edef\diagbox@slashbox@options{%
              167
                       \unexpanded\expandafter{\diagbox@slashbox@options}%
              168
                       \unexpanded{width=#1,}}%
              169
```

- 170 \fi
- 171 \slashbox@@}

\slashbox@@

172 \newcommand\slashbox@@[3][]{%
173 \edef\diagbox@slashbox@options{%
174 \unexpanded\expandafter{\diagbox@slashbox@options}%
175 \unexpanded{trim=#1,}}%
176 \expandafter\diagbox\expandafter[\diagbox@slashbox@options]{#2}{#3}}
177 \endinput

版本历史

v1.0		\diagbox: 判断参数个数,选择两部分或
General: 初始版本。	1	三部分盒子。13
v2.0		\diagbox@double: 在使用 trim 选项时去
General: 变更 trim 选项的行为,去掉了		掉内容与盒子边界的间距。这与 slash-
使用 trim 选项时内部的间距。这与		box 的行为不同。 10
slashbox 行为不同。	7	\diagbox@triplebox: 新增三部分双斜线
增加有三部分、双斜线的表头格式。	6	的盒子 12

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斜体的数字表示对应项说明所在的页码。下划线的数字表示定义所在的代码行号;而 直立体的数字表示对应项使用时所在的行号。

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