The `spacingtricks` package*

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1   Introduction

This package offers some macros to deal with spacing issues. Thus:
- `\centered` yields good horizontal centering without vertical spacing;
- `\footnote` has been redefined to avoid unsuitable spacings;
- `\vstrut` produces a strut with variable height or depth;
- `\indent` has been redefined to indent a line at the beginning of a particular paragraph even if `\parindent` has been set to 0;
- the `indentblock` environment produces indentation of all its content;
- the `compactlist` environment yields a compact list, without vertical spacing between the items, like here; several aliases are provided to type some list symbols shorter: `\bul`, `\dash`, `\ddash`, `\aster`, `\hand`, `\checksymb`, `\arrowsymb`;
- the macros `\ie` and `\eg` attends to typeset common abbreviations i.e. and e.g. with correct spacings;
- the `\dualboxes` command attends to place two boxes (figures, tables, text) side by side by adjusting the vertical positioning.

Two other common packages are loaded by spacingtricks: setspace (natively in LaTeX 2_ε), for setting line spacing in a piece of text (with the `spacing` environment), and xspace [1], which adds an interword space unless the macro is followed by a punctuation character.

Otherwise, we provide the package arraycols [6], wich allows a good management of spacings in `tabular` and `array` environments, and mismath [7] of which several macros tends to improve spacings in mathematical formulas.

2   Usage

`\centered`   The `\centered{`⟨*text*⟩`}` command yields a centered line without vertical spacing. It acts like `\centerline` except in lists or tables where its behavior is much better (see the following examples). Moreover, the line break before (but not after) the macro is automatic.

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*This document corresponds to spacingtricks v1.3, dated 2020/11/02.

Here is a comparative example of the centering commands inside a list:

1. Here a centered line with `\centered`:
   Lorem ipsum dolor sit amet, consectetuer adipiscing elit.

2. Here another centered line with `\\` `\centerline`:
   Lorem ipsum dolor sit amet, consectetuer adipiscing elit.

3. Here another centered line with `\par\centerline`:
   Lorem ipsum dolor sit amet, consectetuer adipiscing elit.

4. Here a centered line with the `center` environment:

   Lorem ipsum dolor sit amet, consectetuer adipiscing elit.

In tables, `\centered` allows to center a particular cell independently of the (general) column alignment[1].

left aligned column	right aligned column
another cell	centered cell
centered line	the last cell right aligned

`\footnote`   The `\footnote` command doesn't have a good management of spacing issues, in particular when the hyperref package has been loaded. In English tradition, there is no space before numbers (or symbols) of note calls, and likewise at the beginning of footnotes, text begins immediately after the note number[2]. To avoid undesirable spaces, we don't have to put some space before or after writing `\footnote{`, for instance:

   `this is a note\footnote{good spacing} which works fine,`

but sometimes, it is convenient to place the `\footnote` command on a new line. To achieve this, `\footnote` has been redefined to completely eliminate unwanted spaces[3].

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[1]In tables, we can also use the powerful `\makecell` command of the makecell package [2], on the other hand the `\centerline` command doesn't work for a single line in a cell. Let us also mention the `\centeredline` command, from the package centeredline [3], which allows to use `\verb` commands inside the text to center; but it doesn't work in tables either.

[2]The typesetting of footnotes and note calls depends on national typographic rules which are, in principle, managed by babel. For instance, by activating the `french` option of babel, a thin space is added before the note calls, and the new `\footnote` macro does not alter this behavior.

[3]Probably it would have been enough to recommend the use of the % symbol at the end of line; its effect is to cancel the space produced by a line break, but we do not always think of using it.

```
This a note
\footnote{
Bad spacing example.}
with the old command.
```

This a note ^{a} with the old command.

_____
^{a} Bad spacing example.

```
This a note
\footnote{
Good spacing example.}
with the new command.
```

This a note^a with the new command.

_____
^{a}Good spacing example.

`\footnotespace`
`\footenoteindent`

Like the old one, the new `\footnote` command can take an opional argument to force the number of the note. Likewise, we have always the customization macros `\footnotesize`, `\footnotesep`, `\footnoterule`, but two new macros have been added to manage spacings: `\footnotespace` produces the space before the note call symbol and `\footnoteindent` produces the space at the beginning of the footnote text. For instance, with `\renewcommand{\footnotespace}{\,}` and `\renewcommand{\footnoteindent}{\enskip}`[4] we get:

This is a note ^{a} with particular space settings.

_____
^{a} en dash spacing at the beginning of the note.

`\vstrut`

`\vstrut[`⟨*depth*⟩`]{`⟨*height*⟩`}` produces a strut with variable height or depth, in order to increase the line's height (above the base line) or depth (below the base line, optional); this command can be used in a text line, a table, a list, a formula, etc. If the values of ⟨*height*⟩ and ⟨*depth*⟩ are inferior to the height and depth of the current line, the command has no effect. Here are some examples.

```
\[\frac{\sqrt{0.5p}}{10} =
\frac{\sqrt{\vstrut{1.7ex} 0.5p}}{10}\]
```
$$\frac{\sqrt{0.5p}}{10} = \frac{\sqrt{0.5p}}{10}$$

`\fbox{\vstrut{2ex}$\sigma(X)=1$}` gives $\boxed{\sigma(X) = 1}$ better than $\boxed{\sigma(X) = 1}$

The height adjustment is done by trial and error. We could also have used a vertical phantom box; for example in the previous square root, we get a good result with `\vphantom{\bar{t}}`, but it's not obvious to know what to put in the phantom box, moreover, `\vstrut` allows a finer tuning.

In a table, `\renewcommand{\arraystretch}{`⟨*stretch*⟩`}` allows to increase the height of the rows but this command has a global effect, whereas `\vstrut` allows to adjust properly the height of each row, as in the following table:

bad
$\lim\limits_{\substack{x \to 1 \\ x>1}} \ln\left(\dfrac{x^2}{x-1}\right)$
$\dfrac{a}{b}$
$\displaystyle\int_1^X \dfrac{1}{t}\,\mathrm{d}t$

good	
$\lim\limits_{\substack{x \to 1 \\ x>1}} \ln\left(\dfrac{x^2}{x-1}\right)$	obtained with `\vstrut{3.8ex}`
$\dfrac{a}{b}$	`\vstrut[2ex]{3ex}`
$\displaystyle\int_1^X \dfrac{1}{t}\,\mathrm{d}t$	`\vstrut[2.5ex]{4.2ex}`

_____
[4]`\enskip` is equivalent to `\hspace{0.5em}`.

However, for tables, we have the arraycols package [6], based on cellspace [4], which allows to adjust row heights automatically. Nevertheless, `\vstrut` can be useful for fine adjustments.

In a text line, `\vstrut` can be used in place of `\vspace`.

`\indent`
`\parindentlength` The command `\setlength{\parindent}{0cm}` allow to eliminate any indentation of lines at the beginning of every paragraph. But in this case, the `\indent` command does not work anymore if we want exceptional indentation of a particular paragraph. So, the initial length of `\parindent` has been saved in `\parindentlength` and the command `\indent` has been redefined to still allow indentation of length `\parindentlength`.

`indentblock` The `indentblock` environment allows indentation of a whole block of lines. It has an optional argument which is the length of indentation (set by default to `\parindentlength`). The following lyrics have been indented (and typeset in italic shape) with `\begin{indentblock}\itshape` and stanzas 2 and 4 have been affected by an additional indentation with `\begin{indentblock}[3em]`.

Overhead the albatross hangs motionless upon the air
And deep beneath the rolling waves in labyrinths of coral caves
The echo of a distant time comes willowing across the sand
And everything is green and submarine

    And no one showed us to the land
    And no one knows the where's or why's
    But something stirs and something tries
    Starts to climb towards the light

Strangers passing in the street
By chance two separate glances meet
And I am you and what I see is me
And do I take you by the hand
And lead you through the land
And help me understand the best I can?

    And no one calls us to move on
    And no one forces down our eyes
    No one speaks and no one tries
    No one flies around the sun

`compactlist` As its name tells it, the `compactlist` environment allows to create a "compact" list, i.e. without vertical space neither above nor between items. As for lists in LaTeX, items are generated by the `\item` command. The environment has an optional argument: `\begin{compactlist}[⟨symbol⟩]`.

`\bul` Default item symbol is `\textbullet` but it can be changed. We provide
`\dash` aliases for several symbols commonly used in lists: `\bul` ● (alias for
`\ddash` `\textbullet`), `\dash` – (`\textendash`), `\ddash` — (`\textemdash`), `\aster`
`\aster` ∗ (`\textasteriskcentered`), as well as `\hand` ☞ (`\ding{43}`), `\checksymb`
`\hand` ✓ (`\ding{51}`) and `\arrowsymb` ➢ (`\ding{226}`) which need to load the

`\checksymb`
`\arrowsymb`
pifont package in the preamble. The following example is obtained with `\begin{compactlist}[\checksymb]`:

- ✓ Fisrt item.
- ✓ Second item.
- ✓ Third item.

☞ These aliases can be used directly in text mode, of course. For `\hand`, `\checksymb` and `\arrowsymb`, the symbol is followed by a space if there is no punctuation character just after it (thanks to the macro `xspace` from the `xspace` package [1]).

`\compactlistindent`
This length (fixed at 0.5 em by default) can be modified with `\setlength` to increase or decrease the indentation of the `compactlist` environment. Notice that there are several other ways to construct a compact list in particular with the `noitemsep` key of the `enumitem` package [5].

`\ie`
`\eg`
In English, at the end of a sentence, the point is followed by an em space which is larger than an interword space. We provide the `\ie` (*id est*) and `\eg` (*exempli gratia*) macros, suggested in The LaTeX Companion [9], to get correct spacing after these abbreviations e.g. here. In American typography, a comma is often placed after these abbreviations, what we can get with `\ie,` on the other hand, some authors prefer to typeset *i.e.* in italic shape, which is always possible with `\textit{\ie}`.

`\dualboxes`
Several packages intend to set the text around a figure or a table, but in general we have to give the width of the box containing the figure or the table. Let us mention however the `picins` package [8], cited in The LaTeX Companion [9], which do not ask for the box width and it can also be used with lists. Nevertheless vertical positioning can be tricky. For this purpose, we have written the `\dualboxes[`⟨*pos*⟩`]{`⟨*left*⟩`}{`⟨*right*⟩`}` macro, which places two boxes, ⟨*left*⟩ and ⟨*right*⟩, side by side. These boxes can contain figures, tables, text, `minipage` environments (for several paragraphs and lists), etc. The optional ⟨*pos*⟩ parameter sets the vertical level on which the boxes are aligned: a number between 0 (bottom) and 1 (top, default value). Here is a first example with `\dualboxes[0.65]`.

x	-2	-1	0	1	2	3
$f(x)$	-0.96	-0.71	0	0.59	0.38	0.18
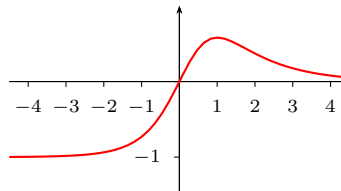
The horizontal space is equally shared between left margin, interbox space and right margin.

In the following example the right box has been shifted back to make an overlaping with the left one, what `picins` cannot do.

x	-2	-1	0	1	2	3
$f(x)$	-0.96	-0.71	0	0.59	0.38	0.18
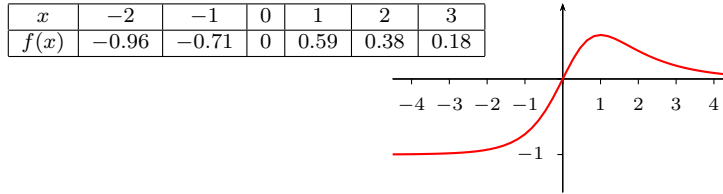
```
\dualboxes*{\footnotesize
   $\begin{array}{|*{7}{c|}} \hline
       x    & -2   & -1   & 0 & 1    & 2    & 3    \\ \hline
       f(x) & -0.96 & -0.71 & 0 & 0.59 & 0.38 & 0.18 \\ \hline
   \end{array}$
}{\mbox{} \hspace{-3cm}
   \begin{pspicture}(-4.5,-1.5)(4.5,1) % needs the pstricks-add package
       \psaxes[labelFontSize=\scriptstyle,ticksize=-2pt,linewidth=0.3pt]
           {->}(0,0)(-4.5,-1.5)(4.5,1)
       \psplot[linecolor=red]{-4.5}{4.5}{x/(EXP(x)-x)}
   \end{pspicture}
}
```

`\dualboxes*` This command has a starred version which eliminates spaces at the beginning and at the end of the line, the only remaining space is between the boxes: `\dualboxes*[⟨pos⟩]{⟨left⟩}{⟨right⟩}`.

Here the left part consist of a paragraph box obtained with `\parbox{7cm}{...}`. If we want several paragraphs, a list or a mathematical displayed formula, in one of the boxes, then we have to put them in a `minipage` environment.
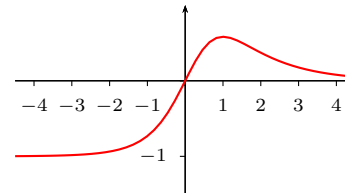
Let us indicate that it's unfortunately not possible to use `verbatim` environments (nor the in-line `\verb` command) within `\dualboxes` arguments, just as it's not possible for footnotes or margin notes.

3   Implementation

```
1 \RequirePackage{ifthen}
2 \RequirePackage{calc}
3 \RequirePackage{setspace}
4 \RequirePackage{xspace}
5
6 \newcommand*{\centered}[1]{{\setlength{\parskip}{0pt}\par\noindent\hfill
7     #1\hfill\mbox{}}}
```

The double braces are necessary here to ensure that the `\parskip` modification applies locally within the command and not globally to the rest of the document.

6

```
 8 \newcommand{\footnotespace}{}
 9 \newcommand{\footnoteindent}{}
10 \let\footnt\footnote
11 \renewcommand{\footnote}[2][]{\unskip\footnotespace%
12     \ifthenelse{\equal{#1}{}}{
13         \unskip\footnt{\footnoteindent\ignorespaces #2}
14     }{
15         \unskip\footnt[#1]{\footnoteindent\ignorespaces #2}
16     }\unskip
17 }
```

\unskip eliminates undesirable spaces before and \ignorespaces after.

```
18 \newlength{\strutheight}
19 \newcommand*{\vstrut}[2][0pt]{%
20     \setlength{\strutheight}{#2}%
21     \addtolength{\strutheight}{#1}%
22     \unskip
23     \ensuremath{\rule[-#1]{0pt}{\strutheight}}%
24     \ignorespaces%
25 }
26
27 \newlength{\parindentlength}
28 \setlength{\parindentlength}{\parindent}
29 \renewcommand{\indent}{\hspace{\parindentlength}}
30
31 \newenvironment*{indentblock}[1][\parindentlength]{
32     \begin{list}{}{%
33         \setlength{\leftmargin}{#1}
34         \setlength{\itemsep}{0pt}
35         \setlength{\topsep}{1ex}
36         \setlength{\partopsep}{0pt}
37         }
38     \item[]
39     }{\end{list}}
40
41 \newlength{\compactlistindent}
42 \setlength{\compactlistindent}{0.5em}
43 \newenvironment*{compactlist}[1][\textbullet]{
44     \par % sometimes necessary
45     \begin{list}{#1\unskip}{% \unskip suppresses the space created by \xspace
46         \setlength{\itemsep}{0pt}
47         \setlength{\parsep}{0pt}
48         \setlength{\topsep}{0ex}
49         \setlength{\partopsep}{0pt}
50         \setlength{\labelwidth}{1em}
51         \setlength{\leftmargin}{\labelwidth}
52         \addtolength{\leftmargin}{\labelsep}
53         \addtolength{\leftmargin}{\compactlistindent}
54         }
55     }{\end{list}}
```

```
56
57 \providecommand{\bul}{\textbullet}
58 \providecommand{\dash}{\textendash}
59 \providecommand{\ddash}{\textemdash}
60 \providecommand{\aster}{\textasteriskcentered}
```

The command `\asterisk` already exists in the mathabx package.

The following macros need the pifont package.

```
61 \providecommand{\hand}{\ding{43}\xspace}
62 \providecommand{\checksymb}{\ding{51}\xspace}
63 \providecommand{\arrowsymb}{\ding{226}\xspace}
64
65 \providecommand{\ie}{i.e.\@\xspace}
66 \providecommand{\eg}{e.g.\@\xspace}
67
68 \newcommand{\@@dualboxes}[3][1]{
69     \par\noindent
70     \raisebox{\depth-#1\totalheight}{#2} \hfill
71     \raisebox{\depth-#1\totalheight}{#3} \smallskip
72     }
73 \newcommand{\@dualboxes}[3][1]{
74     \par\noindent \hfill
75     \raisebox{\depth-#1\totalheight}{#2} \hfill
76     \raisebox{\depth-#1\totalheight}{#3} \hfill\mbox{}\smallskip
77     }
78 \newcommand{\dualboxes}{\@ifstar{\@@dualboxes}{\@dualboxes}}
```

References

[1] *The xspace package*, David Carlisle, Morten Høgholm, CTAN v1.13 2014/10/28.

[2] *The makecell package*, Olga Lapko, CTAN, v0.1e 2009/08/03.

[3] *centeredline – A macro for centering lines*, Jean-François Burnol, CTAN, v1.1 2019/05/03.

[4] *The cellspace package*, Josselin Noirel, CTAN, v1.8 2019/03/11.

[5] *Customizing lists with the enumitem package*, Javier Bezos, CTAN, v3.9 2019/06/20.

[6] *The arraycols package*, Antoine Missier, CTAN, v1.0 2019/06/26.

[7] *mismath – Miscellaneous mathematical macros*, Antoine Missier, CTAN, v1.6 2019/09/06.

[8] *Bilder in LaTeX-Dokumenten – PicIns-Benutzerhandbuch*, Joachim Bleser, Edmund Lang, CTAN, v3.0 sept. 1992.

[9] *The LaTeX Companion*. Frank Mittelbach, Michel Goossens, Johannes Braams, David Carlisle, Chris Rowley, 2nd edition, Pearson Education, 2004.