The \texttt{fouridx} package*

Stefan Karrmann
\texttt{s.karrmann at web.de}

File Date 2008/03/27, Printed November 21, 2013

Abstract
This package enables left subscripts and superscripts in math mode. These subscripts and superscripts are automatically raised for better fitting to the symbol they belong to. This is done in such a way that the left and right subscripts and superscripts are set on the same line, respectively.

Contents

1 Introduction 1
  1.1 Old bugs/regression ................................. 2
  1.2 Comparison with sideset ............................ 2

2 Usage of the package 2

3 The implementation 3

Copyright
Copyright 2007, 2013 Stefan Karrmann.
This program can be redistributed and/or modified under the terms of the \LaTeX{} Project Public License Distributed from CTAN archives in directory macros/latex/base/lppl.txt; either version 1 of the License, or any later version.

1 Introduction

In mathematical equations, it is sometimes necessary to use indices (subscript or superscript) that are positioned at the left side of a symbol. In tensor mathematics, for instance, some notations use a transposed sign at the left side of the symbol:

\[ ^t(A_{ij}) = (A_{ji}) \]

*This file has version 1.00 last revised 2008/03/27.
For symbols with a normal character height, this can be reached by simply put
the indices without an own symbol:

$$\{^1_2\}a_{^3_4}\quad \{^1_2\}a_{^3_4}$$

Is the symbol larger, this leads to unsatisfactory results:

$$^{^1_2}\left(\frac{1}{b}\right)^{^3_4}\quad \frac{\left(\frac{1}{b}\right)^3}{4}$$

If the subscripts on the left and right side are of different height or the left sub-
scripts and superscripts are of different width, the result is also unsatisfactory:

$$^{\left(\frac{1}{b}\right)^{^3_4}}\{^k_n\}A_{\overline{x\vert}}\quad \{^k_n\}A^{\overline{x\vert}}$$

A better output can be reached by using the package fouridx.sty:

$$\{^1_2\}\{^3_4\}\{^{\left(\frac{1}{b}\right)}_4\}\{^{\left(\frac{k}{x}\right)}_\overline{x\vert}\}A$$

A better output can be reached by using the package fouridx.sty:

$$\{^1_2\}\{^3_4\}\{^{\left(\frac{1}{b}\right)}_4\}\{^{\left(\frac{k}{x}\right)}_\overline{x\vert}\}A$$

1.1 Old bugs/regression

<table>
<thead>
<tr>
<th>Error</th>
<th>version</th>
<th>old</th>
<th>actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>math style ignored</td>
<td>1.00</td>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
</tr>
<tr>
<td>hang over at left after line breaks</td>
<td>1.00</td>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
</tr>
<tr>
<td>wrong positions if nested</td>
<td>1.00</td>
<td>$\frac{1}{2}$</td>
<td>$\frac{1}{2}$</td>
</tr>
</tbody>
</table>

1.2 Comparison with sideset

The command sideset from the ansmath package has similar functionality. It
requires that the central box is a math operator and it typesets the left super-
and subscript left aligned while fourIdx uses right alignment. Which suits better
depends on the purpose.

2 Usage of the package

One command is provided by the package.

\fourIdx The \fourIdx command has the syntax \fourIdx\{left superscript\}\{left subscript\} \{right superscript\}\{right subscript\}\{symbol\}. This command
typesets the symbol \{symbol\} with indices on the left and on the right side. For
example:
You may omit left or right indices by using empty arguments.

The next example shows the same in the different mathematical styles:

\[
\frac{1}{2} \left( \frac{1}{2} \right)_4^3
\]

3 The implementation

Heading of the package:

\newcommand{\fourIdx}{%}

```latex
\ensuremath{\mathchoice{{\setbox1=\hbox{$\scriptstyle{#1}$}\setbox2=\hbox{$\scriptstyle{#2}$}\setbox5=\hbox{$\displaystyle{#5}$}\hspace*{\ifnum\wd1>\wd2\wd1\else\wd2\fi}\copy5^\scriptstyle\hspace{-\wd1}\hspace{-\wd5}#1\hspace{\wd5}#3}_{\scriptstyle\hspace{-\wd2}\hspace{-\wd5}#2\hspace{\wd5}#4}}{\setbox1=\hbox{$\scriptstyle{#1}$}\setbox2=\hbox{$\scriptstyle{#2}$}\setbox5=\hbox{$\textstyle{#5}$}\hspace*{\ifnum\wd1>\wd2\wd1\else\wd2\fi}\copy5^\scriptstyle\hspace{-\wd1}\hspace{-\wd5}#1\hspace{\wd5}#3}_{\scriptstyle\hspace{-\wd2}\hspace{-\wd5}#2\hspace{\wd5}#4}}{\setbox1=\hbox{$\scriptscriptstyle{#1}$}\setbox2=\hbox{$\scriptscriptstyle{#2}$}\setbox5=\hbox{$\scriptstyle{#5}$}\hspace*{\ifnum\wd1>\wd2\wd1\else\wd2\fi}\copy5^\scriptscriptstyle\hspace{-\wd1}\hspace{-\wd5}#1\hspace{\wd5}#3}_{\scriptscriptstyle\hspace{-\wd2}\hspace{-\wd5}#2\hspace{\wd5}#4}}{\scriptscriptstyle{#5}}}%
```

3 \newcommand{\fourIdx}{%}

```latex
\needsTeXFormat{LaTeX2e}[1995/12/01]
\ProvidesPackage{fouridx}[\filedate\space v\fileversion\space Four indices]
\fourIdx Command for left and right indices.
```