

The `alrtex` package

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This is the package `alrtex` which will try to give an experimental new way to write \LaTeX code. So far it is mostly done with very dirty code and actually it's a collection of things that come into my mind during boring lectures. Maybe someone will have fun with the following code fragments.

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1 introduction

The problem I have with L^AT_EX¹ is the antique way of typing. Because most people still use a hopelessly outdated keyboard layout („qwerty“ or slightly adapted versions of that), L^AT_EX doesn't make use of some cool features. I'm not talking about writing chinese or arabic text! Maybe this example will make the idea clear:

In standard L^AT_EX, one has to write

```
This is the normal text, then comes the itemization:
\begin{itemize}
  \item text for first item
  \item \begin{itemize}
    \item this is an item inside an item...
    \item[$\rightarrow$] Here an item with a formula: $\int_a^b x^2 dx$
  \end{itemize}
  \item and the outer itemize goes on...
\end{itemize}
```

Using this package and having a superior keyboard layout², you can simply write:³

This is the normal text, then comes the itemization:

- text for first item
- - this is an item inside an item
 - [\Rightarrow] Here an item with a formula: $\int_a^b x^2 dx$
- and the outer itemize goes on...

And your normal text goes on...

Well, actually I'm lying now because this is not fully implemented so far. But it's the aim of this package to provide this – besides many, many other funny and cool things. The aim is to offer a more „wysiwyg“ way, without loosing anything of logical markup. One still can re\define the • if he doesn't like the way his items look. I have just started to write the package, there will be much more stuff here in the future.

Ok, enough blahblah, now comes the code. We begin with the mostly uninteresting preamble stuff:

```
1 \ProvidesPackage{alttex}
```

¹I'll write L^AT_EX instead of X_YL^AT_EX—saves me two keystrokes. Most of the code below *only* works with X_YL^AT_EX. If you need support for [utf8]inputenc or LuaL^AT_EX, please contact the author.

²E.g. the ergonomic layout NEO.

³The lmodern font I'm using here does not have the symbol for the inner item , so we change to DejaVu Sans Mono here.

```

2
3 \RequirePackage{amsmath}
4 \let\oldpackage\usepackage
5 \def\usepackage#1{
6   \AtBeginDocument{hallo}
7   \IfFileExists{#1}{
8     \oldpackage{#1}
9   }{
10    \immediate\write18{tlmgr install #1}
11  }
12 }
13 \RequirePackage{exscale}
14 \RequirePackage{ifxetex}
15 \ifxetex
16 \typeout{Loading XeTeX, everything's fine.}
17 \else
18   \typeout{^^J%
19   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!^^J%
20   ! This package can only be compiled with XeLaTeX.^^J%
21   ! pdfLaTeX cannot handle unicode the way it is used here.^^J%
22   ! If you want to have support for [utf8]inputenc, please contact the author.^^J%
23   ! If you want to use LuaLaTeX, give it a try:^^J%
24   ! comment out the lines 32,33,35-43.^^J%
25   ! Please e-mail me the result of your experiences!^^J%
26   !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!^^J%
27   }
28   \errmessage{No XeLaTeX, no alttex. See the log for more information.}
29   \endinput
30 \fi
31

```

We need `exscale` to write really big formulae, and `ifxetex` to check whether one uses the correct engine.

2 Textmode

2.1 no escape

`\noescape` You want to write plain text. Maybe you're annoyed by always escaping characters like `_` `#` `&` `{` `}` `$` `~` and so on. `\noescape` allows you to never escape anything—except the `\`, which still might be used for `\textit{}` or so. Or maybe not... because the `{` `}` are not escaped. Have to think about this one. Maybe the `\` will be redefined to define `{` `}` by itself.

```

32 \def\noescape{
33   \catcode`\_ = 11%
34   \catcode`\^ = 11%
35   \catcode`\# = 11%
36   \catcode`\& = 11%
37   %\catcode`\{ = 11%

```

```

38 %\catcode`\}= 11%
39 \catcode`\$= 11%
40 \catcode`\-= 11%
41 \makeatletter% I just noticed this is not necessary... but I'll leave it for some strange \thin@gs or
42 \catcode`\%= 11
43 }
1

```

\oldescape Of course this has to be reset when doing anything like formula, tabular etc. Maybe I will be able to change the behaviour automatically. Thas idea has been inspired by a discussion on the ConT_EXt mailinglist.

```

44 \def\oldescape{
45   \catcode`\%= 14%
46   \catcode`\_= 8%
47   \catcode`\^= 7%
48   \catcode`\#= 6%
49   \catcode`\&= 4%
50   %\catcode`\{= 1%
51   %\catcode`\}= 2%
52   \catcode`\$= 3%
53   \catcode`\-= 13%
54   \makeatother%
55 }

```

2.2 tables

The way one has to type extensive tables is quite complex – and the resulting code is often not really readable. I don't have an idea how to change this, but I'm thinking about it. Just a reminder to myself... mail me any suggestions for this!

3 Math stuff

3.1 braces

\newbraces Now this is something most L^AT_EX-beginners don't recognize and wonder why the
\oldbraces formula looks so ugly: The braces () do not fit to the hight of the formula. This can be achieved by putting **\left** and **\right** in front of the braces. But actually, this is annoying! In almost any case you want this behaviour, so this should be the standard. So we redefine the way braces are handled. With **\newbraces** the () always fit. If you prefer the normal L^AT_EX way, use **\oldbraces** to reset everything. This new behaviour should be extended to other characters like | [{ < and so on. Maybe in version 0.0.1...

I would have never been able to implement this without the help of the mailinglist members of **tex-d-1@listserv.dfn.de**!

The redefinition of **\mathstrut** is necessary when using amsmath (you will use amsmath when typesetting formulae, won't you?), because the hight of formulae is determinated by the hight of a brace. But using () as **\active** characters, we

Maybe one could "temporarily hardcode" the height of $[$ and then use this...

need another brace here. So we take $[$. This will probably also change. But the code is working fine for $()$.

```

56 \makeatletter
57 \def\resetMathstrut{%
58   \setbox\z@\hbox{%
59     \mathchardef\@tempa\mathcode`\[\relax
60     \def\@tempb##1"##2##3{\the\textfont"##3\char"}%
61     \expandafter\@tempb\meaning\@tempa \relax
62 }%
63 \ht\Mathstrutbox@\ht\z@ \dp\Mathstrutbox@\dp\z@
64 }
65 \makeatother
66
67 \edef\oldbraces{
68   \mathcode`\(\the\mathcode`(
69   \mathcode`)\the\mathcode`)
70 }
71 \begingroup
72   \catcode`\active \xdef(\left\string{
73   \catcode`)\active \xdef)\right\string)}
74 \endgroup
75
76 \def\newbraces{
77   \mathcode`("8000
78   \mathcode`) "8000
79 }

```

`hugedisplaymath` Sometimes, especially in presentations, you might need an really big formula. Imagine two hours of struggle with transformations—and finally there is the beautiful formula. Now you can say

```
\begin{hugedisplaymath} E = mc^2 \end{hugedisplaymath}
```

There should be several steps of size, maybe.

```

80 \def\hugedisplaymath{
81   \makeatletter
82   \makeatother
83   \Huge
84   \begin{equation*}
85 }
86 \def\endhugedisplaymath{
87   \end{equation*}
88 }

```

4 itemize and similar things

4.1 itemize with a single character

- instead of `\item` Here we use an active character (mostly a unicode character bullet •) for the whole construct. And another one for nested itemizations (like a triangular bullet ▸).

This does—guess it—not work correctly so far. I’m trying to find a tricky way so that the ending character is not necessary any more. So far one has to end an itemize with something like an – (em-dash). There will also be a possibility to change the characters responsible for the whole action.⁴

`\newitemi` The following ugly peace of code is written by me, defining the conditional inser-
`\newitemii` tion of the `\begin{itemize}`. This will be assigned to an active character using
`\makeitemi` and `\makeitemii`, respectively.

```
89 \def\notinside{}
90 \def\inside{}
91 \let\insideitemizei\outside
92 \let\insideitemizeii\outside
93
94 \def\newitemi{
95   \ifx\insideitemizei\inside
96     \expandafter\item%
97   \else
98     \begin{itemize}
99       \global\let\insideitemizei\inside
100       \expandafter\item%
101   \fi
102 }
103
104 \def\newitemii{
105   \ifx\insideitemizeii\inside
106     \expandafter\item%
107   \else
108     \begin{itemize}
109       \global\let\insideitemizeii\inside
110       \expandafter\item%
111   \fi
112 }
```

Ok, the following code is stolen from the `shortvrb` package, and I don’t understand anything of it. But I keep on trying... nevertheless, it’s working fine, as far as I can see.

`\makeitemi` With this macro, you can define the character you want to use for first-level
`\makeitemii` itemize. (Guess the sense of `\makeitemii`...) Default ist • for first-level and ▸ for second-level. Maybe this will be extended till fourth level. More doesn’t seem to make any sense.

⁴The triangular bullet sign does not appear here – the font is lacking it...

```

113 %
114 \makeatletter
115 \def\makeitemi#1{%
116   \expandafter\ifx\csname cc\string#1\endcsname\relax
117     \add@special{#1}%
118     \expandafter
119     \xdef\csname cc\string#1\endcsname{\the\catcode`#1}%
120     \begingroup
121       \catcode`\~\active \lccode`\~`#1%
122       \lowercase{%
123         \global\expandafter\let
124         \csname ac\string#1\endcsname~%
125         \expandafter\gdef\expandafter~\expandafter{\newitemi}}%
126     \endgroup
127     \global\catcode`#1\active
128   \else
129     \fi
130 }
131
132 \def\makeitemii#1{%
133   \expandafter\ifx\csname cc\string#1\endcsname\relax
134     \add@special{#1}%
135     \expandafter
136     \xdef\csname cc\string#1\endcsname{\the\catcode`#1}%
137     \begingroup
138       \catcode`\~\active \lccode`\~`#1%
139       \lowercase{%
140         \global\expandafter\let
141         \csname ac\string#1\endcsname~%
142         \expandafter\gdef\expandafter~\expandafter{\newitemii}}%
143     \endgroup
144     \global\catcode`#1\active
145   \else
146     \fi
147 }

```

Now there are the two helperfunctions – no guess what they are really doing.

```

148 \def\add@special#1{%
149   \rem@special{#1}%
150   \expandafter\gdef\expandafter\dospecials\expandafter
151   {\dospecials \do #1}%
152   \expandafter\gdef\expandafter\@sanitize\expandafter
153   {\@sanitize \@makeother #1}}
154 \def\rem@special#1{%
155   \def\do##1{%
156     \ifnum`#1=`##1 \else \noexpand\do\noexpand##1\fi}%
157   \xdef\dospecials{\dospecials}%
158   \begingroup
159     \def\@makeother##1{%
160       \ifnum`#1=`##1 \else \noexpand\@makeother\noexpand##1\fi}%

```

```

161 \xdef\@sanitize{\@sanitize}%
162 \endgroup}
163 \makeatother

```

^{1 2 3} And we do just the same stuff with `\enumerate`. But here we take the ¹ as first level item, the ² as second level etc. This may be confusing some way, but just try it.

For the implementation: copy-pasted the code above, nothing interesting so far.

```

164 \let\insideenumi\outside
165 \let\insideenumii\outside
166
167 \def\newenumi{
168   \ifx\insideenumi\inside
169     \expandafter\item%
170   \else
171     \begin{enumerate}
172       \global\let\insideenumi\inside
173       \expandafter\item%
174     \fi
175 }
176
177 \def\newenumii{
178   \ifx\insideenumii\inside
179     \expandafter\item%
180   \else
181     \begin{enumerate}
182       \global\let\insideenumii\inside
183       \expandafter\item%
184     \fi
185 }
186

```

We use the same methods as above, still not understanding, what they are doing. Just changing two lines of code and hoping, everything will be fine.

```

187 \makeatletter
188 \def\makeenumi#1{%
189   \expandafter\ifx\csname cc\string#1\endcsname\relax
190     \add@special{#1}%
191     \expandafter
192     \xdef\csname cc\string#1\endcsname{\the\catcode`#1}%
193     \begingroup
194       \catcode`\~\active \lccode`\~`#1%
195       \lowercase{%
196         \global\expandafter\let
197         \csname ac\string#1\endcsname~%
198         \expandafter\gdef\expandafter~\expandafter{\newenumi}}%
199     \endgroup
200     \global\catcode`#1\active
201   \else

```



```

202 \fi
203 }
204
205 \def\makeenumii#1{%
206 \expandafter\ifx\csname cc\string#1\endcsname\relax
207 \add@special{#1}%
208 \expandafter
209 \xdef\csname cc\string#1\endcsname{\the\catcode`#1}%
210 \begingroup
211 \catcode`\~\active \lccode`\~`#1%
212 \lowercase{%
213 \global\expandafter\let
214 \csname ac\string#1\endcsname~%
215 \expandafter\gdef\expandafter~\expandafter{\newenumii}%
216 \endgroup
217 \global\catcode`#1\active
218 \else
219 \fi
220 }
221 \makeatother
222

```

Finally, we set the default characters for the items and enumerations:

```

223 \makeitemi•
224 \makeitemii
225 \makeenumi1
226 \makeenumii2

```

Tabelle, blindtext

And that's it. Happy \LaTeX ing!