catcodes

—

"Generic" Switching of Category Codes

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Abstract

The catcodes bundle provides small packages for switching category codes, usable both with LaTeX and without. (i) stacklet.sty maintains stacks for "private letters," needed for plainpkg.tex's minimal framework for "generic" packages. (ii) actcodes.sty deals with "active characters," switching their category codes and assigning meanings to "active-character tokens." (iii) catchdq.sty uses the "ASCII double quote" as an active character for simplified access to typographical double quotes.—These packages are "generic" in the sense that they should be usable at least both with LaTeX and Plain TeX, based on plainpkg.tex.

Required Packages: plainpkg, stacklet

Related Packages: catoptions, pcatcode from amsrefs, texapi, csquotes.

Keywords: Macro programming, category codes, private letters, active characters, double quotes

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1 Overview

Sorry, . . . , the abstract and the table of contents must suffice for today (2012-11-07) TODO

2 Shared Features of Usage

All the packages of the bundle are "plainpkg packages" in the sense of the plainpkg[1] documentation that exhibits details of what is summarized here. Therefore:

[1] ctan.org/pkg/plainpkg

- All of them require that TEX finds `plainpkg.tex` as well as `stackrel.sty`.
- In order to load ⟨*catcodes*⟩`.sty` (where ⟨*catcodes*⟩ is `stacklet`, `actcodes`, or `catchdq`), type `\usepackage{`⟨*catcodes*⟩`}` within a LATEX document preamble, `\RequirePackage{`⟨*catcodes*⟩`}` in a "plainpkg package", or `\input␣`⟨*catcodes*⟩`.sty` ... or perhaps `\input{`⟨*catcodes*⟩`.sty}`?

3 actcodes.sty—Active Characters

3.1 Introduction

Active characters can simplify syntax often, i.e., the code may be very pleasant to type and read. But sometimes something may fail. See Section 3.3.2 for how to cope with possibilities and difficulties.

3.2 Package File Header—plainpkg and Legalese

```
1                                                   \input plainpkg
2  \ProvidesPackage{actcodes}[2012/11/07 v0.2a active characters (UL)]
3  %%
4  %% Copyright (C) 2012 Uwe Lueck,
5  %% http://www.contact-ednotes.sty.de.vu
6  %% -- author-maintained in the sense of LPPL below --
7  %%
8  %% This file can be redistributed and/or modified under
9  %% the terms of the LaTeX Project Public License; either
10 %% version 1.3c of the License, or any later version.
11 %% The latest version of this license is in
12 %%     http://www.latex-project.org/lppl.txt
13 %% There is NO WARRANTY (actually somewhat experimental).
14 %%
15 %% Please report bugs, problems, and suggestions via
16 %%
17 %%   http://www.contact-ednotes.sty.de.vu
18 %%
```

3.3 Purpose and Usage

The package derives from switching category codes in the nicetext and morehype bundles and should improve them.

3.3.1 Installing and Calling

The file `actcodes.sty` is provided ready, installation only requires putting it somewhere where TEX finds it (which may need updating the filename data base).[2] However, the files `plainpkg.tex` and `stacklet.sty` must be installed likewise.

[2] `http://www.tex.ac.uk/cgi-bin/texfaq2html?label=inst-wlcf`

With LaTeX, the file should be loaded by `\RequirePackage{actcodes}` or `\usepackage{actcodes}`.

Without LaTeX, load it by `\input␣actcodes.sty`.

As explained in `plainpgk-doc.pdf`, however, "generic" packages based on plainpkg should load actcodes by `\RequirePackage{actcodes}`.

3.3.2 Commands and Syntax

actcodes.sty provides `\MakeActive`, `\MakeActiveAss`, `\MakeActiveDef`, `\MakeActiveLet`, `\MakeOther`, `\MakeActiveOther` with rather obvious syntax—you find more detailed descriptions mixed with implementation below ... TODO —Without LaTeX, the latter's internal `\@gobble`⟨*arg*⟩ is provided as well.

3.4 The Code

3.4.1 Our Private Letters

```
19  \PushCatMakeLetterAt
```

3.4.2 The Core

`\MakeActiveAss`⟨*ass-fun*⟩`\`⟨*char*⟩⟨*ass-args*⟩ "activates" ⟨*char*⟩ and then applies assignment function ⟨*ass-fun*⟩ with arguments ⟨*ass-args*⟩ to it. The code derives from LaTeX's `\@sverb` and `\do@noligs` and was also discussed on the LATEX-L mailing list September 2010 (Will Robertson; Heiko Oberdiek). The present definition generalizes `\MakeActiveDef` and `\MakeActiveLet` of my earlier packages.

```
20  \gdef\MakeActiveAss#1#2{%
21    \MakeActive#2%
22    \begingroup \lccode`\~`#2\relax \lowercase{\endgroup #1~}}
```

I was reluctant to provide `\MakeActive`\⟨*char*⟩, but with catchdq.sty, it would be better ...

```
23  \gdef\MakeActive#1{\catcode`#1\active}
```

... it just "revives" the meaning that the corresponding active-character token last time ...

3.4.3 `\def` and `\let`

`\MakeActiveDef`\⟨*char*⟩⟨*parameters*⟩`{`⟨*replace*⟩`}` has been employed in fifinddo and blog (which is based on fifinddo) so far.

```
24  \gdef\MakeActiveDef{\MakeActiveAss\def}
```

W.r.t. the definition of this `\MakeActiveDef`, Heiko Oberdiek remarked that it allows *macro parameters*, as opposed to my earlier definition in fifinddo. Without parameters, this kind of macro has been used for conversion of text encodings (atari.fdf, and I thought this was the idea of stringenc ...).

`\MakeActiveLet\`⟨*char*⟩⟨*cmd*⟩ has been provided in niceverb so far. The present package has been made in order to have `\MakeActiveLet` with blog.sty as well, it was too annoying to use `\MakeActiveDef` there so often.

```
\gdef\MakeActiveLet{\MakeActiveAss\let}
```

3.4.4 Switching Back ...

Sometimes, the "active" behaviour of ⟨*char*⟩ is too difficult, and you may want to switch bach to its "simple" way ... This may work by `\MakeOther\`⟨*char*⟩ ... with LaTeX, `\MakeOther` just is `\@makeother` ...

```
\ifltx \global\let\MakeOther\@makeother
\else  \gdef\MakeOther#1{\catcode`#112\relax}
\fi
```

But within a macro (or other) argument, you can't change the `\catcode`. (I lost some time by not realizing that it was within a large argument where I tried to switch the `\catcode`.) Anyway or in certain cases, it may be better to keep a character "active" throughout a document and just to change the *expansion* of the "active-character token." This can be done with `\MakeActiveLet` and `\MakeActiveDef` in certain cases already. E.g., when the *"blank space"* has been "activated" by `\obeylines`, `\MakeActiveLet\␣\space` "undoes" this half-way, while it does not restore "argument skipping" and "compressing blank spaces."

When character ⟨*char*⟩ should be "active" for some time, but for certain moments you prefer that it behaves like an "other character", you can switch to its "other" expansion by `\MakeActiveOther\`⟨*char*⟩:

```
\gdef\MakeActiveOther#1{%
    \MakeActiveAss\edef#1{\expandafter\@gobble\string#1}}
```

`\MakeActiveOther` uses LaTeX's `\@gobble`⟨*arg*⟩, *without* LaTeX, actcodes provides it:

```
\ifltx\else \long\gdef\@gobble#1{} \fi
% \show_ \MakeActiveOther\_ \show_ \expandafter\show_
```

I am *not* providing a version *without* the `\catcode` change, although the latter is superfluous here TODO ...

`niceverb` also provides `\MakeNormal\`⟨*char*⟩, it may migrate to here in the future, and there may be `\MakeActiveNormal\`⟨*char*⟩ extending the above `\MakeActiveOther` TODO ...

Also, a *stack* might be used as in stacklet, even to switch *meanings* of active-character tokens ... not sure TODO ...

babel does similar things, but I never have ... TODO

3.4.5 Leaving and Version History

```
\PopLetterCatAt
\endinput
```

VERSION HISTORY

```
v0.1   2012/08/26   started, almost completed
       2012/08/27   completed; realizing \Push...At ..., bug fixes
v0.2   2012/08/28   \global\let, \def -> \gdef
       2012/09/16   \MakeActive
       2012/09/19   doc.: stacklet
v0.2a  2012/11/07   doc.: |...| on \MakeNormal
```

4 catchdq.sty—Typographical Double Quotes

4.1 Introduction

The catchdq package allows getting typographical double quotes by just using the "ASCII double quote" `"`. A more precise overview:

1. Typically, "typographical" quotation marks mean distinguishing between "opening" and "closing" quotation marks. Usually, you must enter different characters or commands for the distinction, such as ` `` ` for "opening" and `''` for *closing*—in *English* with *TEX*. For *English* with *Plain TEX*, even `"` suffices for "closing."

2. There are much different conventions especially for *German* and *French*. They require different characters or TEX commands than for *English*. The packages german, ngerman, and babel have dealt with such conventions.

3. Understanding the ideas mentioned before has been difficult for a long time, probably because typewriter and computer *keyboards* never have offered the appropriate keys. Rather, they only offered the "ASCII double quote" that produced an approximation ("neutral quotation marks") *not* making the difference. Many users and readers have not realized the difference, they have not realized how their screen or printer output differed from double quotes in books and newspapers. Cf. the Wikipedia article[3]

4. The idea of the catchdq package is that the user indeed should not worry about that difference and just type "ASCII double quotes", and they should be "converted" into the appropriate typographical quotation marks *automatically*. This should work by "toggling," i.e., the first "ASCII double quote" is interpreted as "opening," the second as "closing," the next one as "opening" ...—Word processors have provided this feature (as an option) as well.

[3] en.wikipedia.org/wiki/Quotation mark

5. Language-dependency of the feature currently is managed through the langcode package.

6. The feature may cause problems sometimes. Therefore, explicit switching the feature "on" and "off" is required.

7. The csquotes package addresses the issue in a more comprehensive and perhaps more stable way.

See Section 4.3.2 for additional details.

4.2 Package File Header—plainpkg and Legalese

```
42                                                \input plainpkg
43  \ProvidesPackage{catchdq}[2012/09/20 v0.2 simple typographic dqs (UL)]
44  %%
45  %% Copyright (C) 2012 Uwe Lueck,
46  %% http://www.contact-ednotes.sty.de.vu
47  %% -- author-maintained in the sense of LPPL below --
48  %%
49  %% This file can be redistributed and/or modified under
50  %% the terms of the LaTeX Project Public License; either
51  %% version 1.3c of the License, or any later version.
52  %% The latest version of this license is in
53  %%     http://www.latex-project.org/lppl.txt
54  %% There is NO WARRANTY (actually somewhat experimental).
55  %%
56  %% Please report bugs, problems, and suggestions via
57  %%
58  %%   http://www.contact-ednotes.sty.de.vu
59  %%
```

4.3 Purpose and Usage

4.3.1 Installing and Calling

The file `catchdq.sty` is provided ready, installation only requires putting it somewhere where TEX finds it (which may need updating the filename data base).[4] However, the files `plainpkg.tex` and `stacklet.sty` must be installed likewise.

With LATEX, the file should be loaded by `\RequirePackage{catchdq}` or `\usepackage{catchdq}`.

Without LATEX, load it by `\input␣catchdq.sty`.

As explained in `plainpgk-doc.pdf`, however, "generic" packages based on plainpkg should load catchdq by `\RequirePackage{catchdq}`.

[4] `http://www.tex.ac.uk/cgi-bin/texfaq2html?label=inst-wlcf`

4.3.2 Commands and Syntax

catchdq.sty (indirectly) allows using `"⟨no-dqs⟩"` for surrounding ⟨*no-dqs*⟩ with typographical quotation marks, using that double quote `"` as an active character. As rendering that " active during defining macros can corrupt the latter, the user (or package writer) must activate that " explicitly by `\catchdqs`.

Further difficulties may arise after `\catchdqs`, various ways to get around them are described in the remaing sections.

4.4 The Code

4.4.1 Required

The package is an application (of ideas of) actcodes.sty:

```
60  \RequirePackage{actcodes}
```

4.4.2 The Core: `\catchdq`

`\catchdq⟨no-dqs⟩"` will expand to `\dqtd{⟨no-dqs⟩}`, provided the ASCII double quote is an active character:

```
61  {\MakeActive\"\gdef\catchdq#1"{\dqtd{#1}}}
```

4.4.3 What Double Quotes Actually Are

`\dqtd` in turn is a kind of "variable." blog.sty offered `\endqtd` for English typographical double quotes, `\dedqtd` for German ones, and `\asciidqtd` for "non-typographical" double quotes (as needed for XML attributes). `\asciidq` accesses a single ASCII double quote, `\enldq` a single English typographical left one, `\enrdq` a single English typographical right one. (It may be useful to access them indepentently of each other, in certain complex situations ...) blog.sty, dealing with HTML, of course has different ideas about them TODO.

```
62  \gdef\asciidq{"}
63  \gdef\asciidqtd#1{"#1"}
```

We allow loading catchdq *after* another package (such as blog.sty) has chosen meanings for `\endqtd` and the like (difficult TODO)

```
64  \ifx\enldq \undefined \gdef\enldq{``}                \fi
65  \ifx\enrdq \undefined \global\let\enrdq\asciidq      \fi
66  \ifx\endqtd\undefined \gdef\endqtd#1{\enldq#1\enrdq} \fi
```

Typographical alternatives to `\endqtd` may be obtained from ngerman.sty or so, if you are smart ... (see Section 4.4.4 for how it works):

```
67  \ifx\dedqtd\undefined \gdef\dedqtd#1{\glqq#1\grqq}   \fi
```

blog.sty, dealing with HTML, had a different idea about `\endqtd` of course. It has also used the mechanism of the langcode package that allows using `\dqtd` and other language-depended constructs with an "implicit" choice according to the "current language code," which should appear soon.

4.4.4 Switching

blog.sty usually does a single switch which gets a new name now: `\catchdqs`.

```
68  \gdef\catchdqs{\MakeActiveLet\"\catchdq}
```

After this, `"⟨no-dqs⟩"` will expand to `\dqtd{#1}`. The default expansion for `\dqtd` will be `\endqtd`:

```
69  \ifx\dqtd\undefined \global\let\dqtd\endqtd \fi
```

Might be done by `\endqs`—when there are alternatives, but blog.sty and langcode.sty do this in a different way ... TODO

```
70  % \gdef\endqs{\let\dqtd\endqtd}
71  % \ifx\dqtd\undefined \global\endqs \fi
```

Actually, here is a little "Tessst" ... and here with „doytshe doppleta anf...“ ... This has been achieved by

```
\usepackage{ngerman}␣\originalTeX
```

`\MakeOther\"` may switch off catching mode (—done just before, as niceverb at present doesn't render it verbatim). actcodes suggests a different way to return from the `\catchdqs` state: Let the character active and change its meaning only, let it *expand* to its "other" version—by `\activeasciidqs`? `\MakeActiveOther\"` and `\let"\asciidq` (it works!) or `\MakeActiveLet\"\asciidq` (abbreviate as `\activeasciidqs`?) ... In blog.sty, there never was a need for switching back. We must rework interaction with niceverb and can perhaps simplify the latter, ... TODO

4.4.5 Leaving and Version History

```
72  \endinput
```

VERSION HISTORY

```
73  v0.1   2010/11/13   in texblog.fdf
74  v0.2   2012/09/17   own file, new ideas ...
75         2012/09/19   doc: stacklet
76         2012/09/20   \dedqtd conditionally; reworked doc.,
77                      tested ngerman.sty
78
```

5 stacklet.sty—Private Letters

5.1 Introduction

"Private letters" *here* are meant to be characters that belong to the "letter" category only within packages. A package typically provides user commands as well as internal commands, and the latter are characterized by containing funny letters in commands such as `\@gobble`. This is to avoid conflicts. See Section 5.3.2 for the commands provided.

5.2 Package File Header—plainpkg and Legalese

```
79                                                  \input plainpkg
80  \ProvidesPackage{stacklet}[2012/11/07 v0.3a private letters (UL)]
81  %%
82  %% Copyright (C) 2012 Uwe Lueck,
83  %% http://www.contact-ednotes.sty.de.vu
84  %% -- author-maintained in the sense of LPPL below --
85  %%
86  %% This file can be redistributed and/or modified under
87  %% the terms of the LaTeX Project Public License; either
88  %% version 1.3c of the License, or any later version.
89  %% The latest version of this license is in
90  %%     http://www.latex-project.org/lppl.txt
91  %% There is NO WARRANTY (actually somewhat experimental).
92  %%
93  %% Please report bugs, problems, and suggestions via
94  %%
95  %%   http://www.contact-ednotes.sty.de.vu
96  %%
```

5.3 Usage

5.3.1 Installing and Calling

The file `stacklet.sty` is provided ready, installation only requires putting it somewhere where TEX finds it (which may need updating the filename data base).[5] However, the file `plainpkg.tex` must be installed likewise.

With LATEX, the file should be loaded by `\RequirePackage{stacklet}` or `\usepackage{stacklet}`.

Without LATEX, both `\input␣stacklet.sty` and `\input␣plainpkg` load `stacklet.sty`.

[5] `http://www.tex.ac.uk/cgi-bin/texfaq2html?label=inst-wlcf`

5.3.2 Commands and Syntax

stacklet.sty provides

`\PushCatMakeLetter\`⟨*char*⟩ *and* `\PopLetterCat\`⟨*char*⟩

for getting "private letters" and giving them back their previous category code in package files with or without LaTeX. As LaTeX has its own stack for `@`, there are also

`\PushCatMakeLetterAt` *and* `\PopLetterCatAt`

that care for `@`'s category code *without* LaTeX only.

5.4 The Code

5.4.1 Name Space

Each "private letter" ⟨*char*⟩ gets its own stack, in some name space, determined by `\cat_stack` (`\withcsname` is from plainpkg.tex):

```
\withcsname\xdef cat_stack\endcsname{%
    \noexpand\string \withcsname\noexpand cat_stack\endcsname
        \noexpand\string}
```

I.e., ?`cat_stack` will expand to

?`string` ?`cat_stack` ?`string`

in the notation of the dowith package documentation.

```
% \withcsname\show cat_stack\endcsname
```

5.4.2 Pushing

`\PushCatMakeLetter\`⟨*char*⟩ ...

```
\xdef\PushCatMakeLetter#1{%
  \noexpand\withcsname
    \withcsname\noexpand pushcat_makeletter\endcsname
      \withcsname\noexpand cat_stack\endcsname#1\endcsname#1}
% \show\PushCatMakeLetter
\withcsname\gdef pushcat_makeletter\endcsname#1#2{%
```

`#1` is the stack token, `#2` is the "quoted" character. Pushing ...

```
    \xdef#1{\the\catcode`#2\relax%
```

... the new entry. `\relax` separates entries, braces instead tend to get lost in popping ... If the stack has existed before, its previous content is appended:

```
            \ifx#1\relax \else #1\fi}%
```

I thought of storing \catcodes hexadecimally (without braces) using LaTeX's \hexnumber, but the latter has so many tokens ... Finally rendering ⟨*char*⟩ a "letter":

```
109       \catcode`#211\relax}
```

Now we can use a "private letter stack" for our own package:

```
110   \PushCatMakeLetter\_
```

5.4.3 Popping

\PopLetterCat\⟨*char*⟩ passes \⟨*char*⟩, the corresponding stack token, and the latter's expansion to \popcat_. \end serves as argument delimiter for the end of the stack only:

```
111   \gdef\PopLetterCat#1{%
112     \expandafter\expandafter\expandafter
113       \popcat_\csname\cat_stack#1\expandafter\endcsname
114         \expandafter \end \csname\cat_stack#1\endcsname#1}
```

\popcat_ parses the expansion, assigns the old category code and and stores the reduced stack:

```
115   \gdef\popcat_#1\relax#2\end#3#4{\catcode`#4#1\gdef#3{#2}}
```

... check existence? TODO

5.4.4 No @ Stack with LaTeX

\PushCatMakeLetterAt is like \PushCatMakeLetter\@ except that it has no effect under LaTeX:

```
116   \gdef\PushCatMakeLetterAt{\ifltx\else\PushCatMakeLetter\@\fi}
```

\PopLetterCatAt by analogy ...

```
117   \gdef\PopLetterCatAt{\ifltx\else\PopLetterCat\@\fi}
```

5.4.5 Leaving the Package File

... in our new way:

```
118   \PopLetterCat\_
119   \endinput
```

5.4.6 VERSION HISTORY

```
v0.1   2012/08/24   started
       2012/08/25   completed
       2012/08/26   extending doc.; \def\withcsname removed
v0.2   2012/08/26   \with_catstack containing \endcsname and with
                    three popping macros replaced by \csname
                    content \cat_stack, cf. memory.tex;
                    restructured
       2012/08/27   \PushCatMakeLetterAt fixed
v0.3   2012/08/27   def.s global
v0.3a  2012/11/06   doc.: "documentation"
       2012/11/07   \filbreak
```