The decorule LaTeX 2ε package*

A decorative swelled rule for LaTeX

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Summary

This package implements a decorative swelled rule using only a symbol from a font installed with all distributions of TeX, so it works independently, without the need to install any additional software or fonts.

This is the packaged version of the macro which was originally published in the 'Typographers' Inn' column in TUGboat (Flynn, 2010).

*This document corresponds to decorule *v.* 0.7p, dated 2020/04/01.

Contents

1 Swelled rules **4**
1.1 Other work 4
1.2 This solution 4

2 Implementation **6**
2.1 Auto-initialisation 6
2.2 Packages required 6
2.3 Preliminary declarations 6
2.4 The main macro 7

A The LaTeX Project Public License (v 1.3c) **10**
A.1 Preamble 10
A.2 Definitions 10
A.3 Conditions on Distribution and Modification 11
A.4 No Warranty 14
A.5 Maintenance of The Work 14
A.6 Whether and How to Distribute Works under This License 16
A.6.1 Choosing This License or Another License 16
A.6.2 A Recommendation on Modification Without Distribution 16
A.6.3 How to Use This License 16
A.6.4 Derived Works That Are Not Replacements 17
A.6.5 Important Recommendations 17

Change History **19**

Index **21**

Latest changes

v.0.7 (2020-04-01)

Regression release

- Updated to use ClassPack 1.19
- Switched all conformance attributes on revision dates to YYYY-MM-DD
- The jump in versions is because the previously submitted version was mis-numbered as 0.6 when it should have been 0.06. Thanks to Erik Braun at CTAN for spotting this.

v.0.34 (2020-04-01)

Regression release

- Recreated package with latest version (1.18) of *ClassPack*
- Fixed bug in using the angle counter that was preventing XeLaTeX generating output

v.0.33 (2019-03-03)

Regression release

- Recreated package with latest version (1.13) of *ClassPack*

v.0.31 (2017-02-10)

Regression release

- Recreated package with latest version (1.04) of *ClassPack*

See p. 19 for earlier changes.

1 Swelled rules

Swelled rules were a popular device in 19th century typesetting, and were usually done as special sorts from a typefounder, or in some cases fabricated from combinations of decorative brass rule cut to calculated lengths.

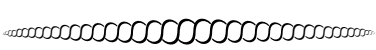
In digital systems, they can be implemented as images or as glyphs in fonts, but are not usually extensible except by distortion. This example is constructed programmatically so that it could be adapted to the width it is required for (that feature is not implemented in this version and is left as an exercise to the user).

1.1 Other work

As discussed in the original article (Flynn, 2010) there is an swrule package by Tobias Dussa (Dussa, 2001) which builds a geometric lozenge from very fine lines, and there is a paper by Steve Peter (Peter, 2005) which describes a more extensible method using METAPOST for ConTEXt.

1.2 This solution

However, it is also possible to produce one using just a character from a font, combined with some looping in a macro with careful positioning and kerning. This example was constructed from the swung dash (`\sim`) character in math mode, rotated and scaled to fit in an ascending and then descending series.



The package is available on CTAN in `http://ctan.org/pkg/decorule`, and the development files will be available at `http://latex.silmaril.ie/packages` when the classpack toolkit is released. Suggestions for improving and extending this package are welcome.

References

Dussa, T. (2001). `swrule.sty`. Retrieved March 20, 2010, from `http://mirror.ctan.org/macros/generic/misc/swrule.sty`

Flynn, P. (2010). Typographers' Inn: Where have all the flowers gone? *TUGboat*, *31*(1), 21–22.

Peter, S. (2005). Swelled rules and METAPOST. *TUGboat*, *26*(3), 193–195.

2 Implementation

The package consists of a single main macro `\decorule`, which cycles through sizes of the symbol from minimum to maximum, rotating and scaling according to values preset here; and then from the maximum back down to the minimum.

2.1 Auto-initialisation

This section is added automatically by *ClassPack* as a preamble to all classes and style packages. The fixltx2e package, which used to be included automatically, is no longer preloaded, as its features are now a part of the latest LaTeX 2_ε kernel.

The code starts with identity and requirements which are generated automatically as needed by the DocTeX system. For details see the ltxdoc package documentation.

```
\NeedsTeXFormat{LaTeX2e}[2009/09/24]
\ProvidesPackage{decorule}[2020/04/01 v0.7
  A decorative swelled rule for \LaTeX{}]
```

2.2 Packages required

fix-cm Allow infinitely-variable font scaling.

```
\RequirePackage{fix-cm}%
```

graphicx Provide for graphics (PNG, JPG, or PDF format (only) for pdflatex; EPS format (only) for standard LaTeX).

```
\RequirePackage{graphicx}%
```

2.3 Preliminary declarations

DCR@min Define a counter and a minimum point size to start and end with. This value is an integer, hence a counter is used.

```
\newcounter{DCR@min}
\setcounter{DCR@min}{1}
```

DCR@max Do the same for the maximum point size that the rule will get to in the middle.

```
\newcounter{DCR@max}
\setcounter{DCR@max}{20}
```

DCR@step Set the step size or the increments of the glyph in whole points.

```
\newcounter{DCR@step}
\setcounter{DCR@step}{1}
```

DCR@rotate Specify the amount in (whole) degrees by which we will need to rotate the symbol to make each glyph mesh with the previous one.

```
\newcounter{DCR@rotate}
\setcounter{DCR@rotate}{45}
```

DCR@size Define a counter to hold the current (calculated) size as we loop through the sizes.

```
\newcounter{DCR@size}
```

\DCR@raise Define a length to hold the amount calculated at each step to raise/lower each glyph by (because we rotate them as we go).

```
\newlength{\DCR@raise}
```

\DCR@skip Define another length to hold the amount calculated to backspace between successive glyphs to make sure they touch.

```
\newlength{\DCR@skip}
```

\DCR@symbol Lastly, define the font character to use as the glyph. For the swelled rule we use the swung dash.

```
\newcommand{\DCR@symbol}{\ensuremath{\sim}}
```

2.4 The main macro

\decorule Now we can define the macro that does the actual work.

```
\newcommand{\decorule}{%
```

Start by setting the initial size to the minimum size declared above:

```
19    \begingroup\fontencoding{OT1}\fontfamily{cmr}\selectfont%
20    \setcounter{DCR@size}{\c@DCR@min}%
```

Loop through the steps up to, but not including, the maximum size (this loop ends on line 28):

```
21    \loop
```

We want to raise each glyph above the baseline by half the point size that we will use, so set the amount to the current size and then divide by two:

```
22      \setlength{\DCR@raise}{\c@DCR@size pt}%
23      \divide\DCR@raise by2
```

Raise, rotate, and (in this case of `\sim`) reflect the glyph in a `\hbox` of its own point size, using `\hss` as infinitely-flexible space to prevent TEX squawking if the glyph is slightly oversized:

```
24      \raisebox{-\DCR@raise}{\fontsize{\c@DCR@size}{0}\selectfont
25        \rotatebox{\the\c@DCR@rotate}{%
26          \reflectbox{\hbox to\c@DCR@size pt{\hss\DCR@symbol\hss}}}}%
```

Calculate the amount to backspace as $^2/_3$ of the current size:

```
27      \setlength{\DCR@skip}{\c@DCR@size pt}%
28      \divide\DCR@skip by3
29      \multiply\DCR@skip by2
30      \kern-\DCR@skip
```

Increment the counter and repeat:

```
31      \addtocounter{DCR@size}{\c@DCR@step}%
32      \ifnum\c@DCR@size<\c@DCR@max
33    \repeat
```

Now do the same for the sole occurrence of the maximum size: this marks the mid-point of the rule:

```
34    \setlength{\DCR@raise}{\c@DCR@max pt}%
35    \divide\DCR@raise by2
36    \raisebox{-\DCR@raise}{%
37      \fontsize{\c@DCR@max}{0}\selectfont
38      \rotatebox{\the\c@DCR@rotate}{\reflectbox{\hbox
39          to\c@DCR@max pt{\hss\DCR@symbol\hss}}}%
```

Start back down following the exact same pattern in reverse, using the current size (one step less than the maximum just used). The value has been left undisturbed from the last loop of the outward journey. This time, however, do the kerning *before* the glyph.

```
40    \loop
41      \setlength{\DCR@skip}{\c@DCR@size pt}%
42      \divide\DCR@skip by3
43      \multiply\DCR@skip by2
44      \kern-\DCR@skip
45      \setlength{\DCR@raise}{\c@DCR@size pt}%
46      \divide\DCR@raise by2
47      \raisebox{-\DCR@raise}{%
48      \fontsize{\c@DCR@size}{0}\selectfont
49      \rotatebox{\the\c@DCR@rotate}{\reflectbox{\hbox
50          to\c@DCR@size pt{\hss\DCR@symbol\hss}}}}%
51      \addtocounter{DCR@size}{-\c@DCR@step}%
52      \ifnum\c@DCR@size>\c@DCR@min
53    \repeat
```

Finally, do the minimum size:

```
54    \setlength{\DCR@skip}{\c@DCR@min pt}%
55    \divide\DCR@skip by3
56    \multiply\DCR@skip by2
57    \kern-\DCR@skip
58    \setlength{\DCR@raise}{\c@DCR@min pt}%
59    \divide\DCR@raise by2
60    \raisebox{-\DCR@raise}{%
61    \fontsize{\c@DCR@min}{0}\selectfont
62    \rotatebox{\the\c@DCR@rotate}{\reflectbox{\hbox
63          to\c@DCR@min pt{\hss\DCR@symbol\hss}}}%
64    \endgroup}
```

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```
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%%% Copyright 2005 M. Y. Name
%%
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%% of this license or (at your option) any later version.
%% The latest version of this license is in
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%% version 2005/12/01 or later.
%%
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%%
%% The Current Maintainer of this work is M. Y. Name.
%%
%% This work consists of the files pig.dtx and pig.ins
%% and the derived file pig.sty.
```

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```
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```

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Change History

v0.11
General: Written for TUGboat: Developed by hand. 1
v0.20
General: Updated to package format: Wrote .dtx file by hand. 1
v0.21
General: Revised for .dtx file: 1) Rewrote documentation; 2) Generated .dtx. 1
`\decorule`: Rearranged spacing to suit the .dtx layout 7
v0.22
General: Bugs fixed on first release: 1) Added missing packages (graphicx and fix-cm); 2) Removed bogus change record from .sty file. . . 1
v0.23
General: Maintenance release: Updated documentation with docmfp, varioref, and geometry. 1
v0.24
General: Internal update: Updated header, replaced docmfp with dox package, checked conformance with latest version of classpack, added packages calc, listings, and palatino. 1
v0.25
General: Changed order of paragraphs and added space . 4
Internal update: Reworded final paragraph of documentation since the package is now available on CTAN. Removed palatino.. . . 1
v0.26
General: Internal update: Regression test for ClassPack v0.74 (autopackage). 1
v0.27
General: Maintenance release: Regression test for ClassPack v0.75 (autopackage with multifile). 1
v0.28
General: Maintenance release: Added PNG image for conversion to EPUB3. 1
v0.29
General: Regenerated: Recreated package with new classpack code to create zip file to the CTAN standard. 1
v0.30
General: Regression release: Recreated package with latest version (1.01) of ClassPack. . . 1
v0.31
General: Regression release: Recreated package with latest version (1.04) of ClassPack. . . 1
v0.32
General: Regression release: Recreated package with latest version (1.06) of ClassPack. . . 1
v0.33
General: Regression release: Recreated package with latest version (1.13) of ClassPack. . . 1
v0.34
General: Regression release: 1) Recreated package with latest version (1.18) of ClassPack; 2) Fixed bug in using the angle counter that was preventing

XeLaTeX generating output. . 1
v0.7
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Index

Numbers written in italic refer to the page where the corresponding entry is described; numbers underlined refer to the code line of the definition; numbers in roman refer to the code lines where the entry is used.

A

\addtocounter 31, 51

C

\c@DCR@max 32, 34, 37, 39
\c@DCR@min . . . 20, 52, 54, 58, 61, 63
\c@DCR@rotate 25, 38, 49, 62
\c@DCR@size 22, 24, 26, 27, 32, 41, 45, 48, 50, 52
\c@DCR@step 31, 51
counters:
  DCR@max 8
  DCR@min 6
  DCR@rotate 12
  DCR@size 14
  DCR@step 10

D

DCR@max (counter) 8
DCR@min (counter) 6
\DCR@raise 15, 22–24, 34–36, 45–47, 58–60
\DCR@raise (length) 15
DCR@rotate (counter) 12
DCR@size (counter) 14
\DCR@skip . . 16, 27–30, 41–44, 54–57
\DCR@skip (length) 16
DCR@step (counter) 10
\DCR@symbol 17, 26, 39, 50, 63
\decorule 18
\divide 23, 28, 35, 42, 46, 55, 59

E

\ensuremath 17

F

fix-cm (package) 4
\fontencoding 19
\fontfamily 19
\fontsize 24, 37, 48, 61

G

graphicx (package) 5

L

lengths:
  \DCR@raise 15
  \DCR@skip 16

M

\multiply 29, 43, 56

N

\newcommand 17, 18
\newcounter 6, 8, 10, 12, 14
\newlength 15, 16

P

packages:
  fix-cm 4
  graphicx 5

R

\raisebox 24, 36, 47, 60
\reflectbox 26, 38, 49, 62
\RequirePackage 4, 5
\rotatebox 25, 38, 49, 62