

# The abracas Package

Asymmetric or arbitrary braces

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## 1 Introduction

The abracas<sup>1</sup> package provides a key-driven interface to supplement new constructions of the traditional `\overbrace` and `\underbrace` pairs.

## 2 User interface

abracas defines two counterparts to the existing braces:

```
\aoverbrace[⟨spec⟩]{⟨stuff⟩}
```

```
\aunderbrace[⟨spec⟩]{⟨stuff⟩}
```

These create an overbrace and underbrace where *⟨spec⟩* defines a construction pattern based on the elements in Table 1.

The provided interface is based on a ratio-principle, allowing one to put a larger share of “filler” (the horizontal rule) at any location within the brace construction. The traditional `\overbrace` and `\underbrace` pairs have a 1:1 share between the left and right side (either side of the tip/cusp of the brace). Using a 1:2 ratio would place the brace cusp one third (from the left) into the brace. Similarly a 3:2 ratio would place the cusp 40% (or two fifths) from the right edge of the brace.

Other, more complex construction – by means of the optional *⟨spec⟩* argument – can also be made by mixing the elements presented in Table 1.

If the package is loaded with the `overload` option

```
\usepackage[overload]{abracas}
```

the traditional `\overbrace` and `\underbrace` pairs are redefined to be equivalent to `\aoverbrace` and `\aunderbrace` respectively via a straight-forward `\let`:

```
\let\overbrace\aoverbrace  
\let\underbrace\aunderbrace
```

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<sup>1</sup>The abracas package: <http://ctan.org/pkg/abracas>

$\langle spec \rangle$ character	Output
l	$\sim$
L	$\frown$
r	$\smile$
R	$\backsim$
U	$\wedge$
D	$\vee$
0	(single) Empty fill
1, ..., 9	Copies of regular fill —
@{ $\langle stuff \rangle$ }	Places $\langle stuff \rangle$ into brace
!{ $\langle len \rangle$ }	Regular fill of length $\langle len \rangle$

Table 1: Character specifications  $\langle spec \rangle$  used to construct braces.

### 3 Examples

Some examples of the types of braces that can be constructed using abracas:

```
\newcommand{\foxanddog}{%
\textrm{The quick brown fox jumped over the lazy dog}}
```

- `\aoverbrace{\foxanddog}` (traditional `\overbrace`):  

- `\aunderbrace{\foxanddog}` (traditional `\underbrace`):  






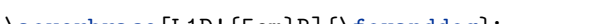
- `\aoverbrace[L3U1R]{\foxanddog}`:  

- `\aoverbrace[l1D1r]{\foxanddog}`:  

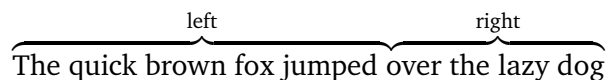
- `\aunderbrace[l2D7r]{\foxanddog}`:  

- `\aunderbrace[l1D2U2D1r]{\foxanddog}`:  

- `\aoverbrace[L1R]{\foxanddog}`:  


- `\aunderbrace[L1U3R]{\foxanddog}`:  

- `\aunderbrace[l6R0l3D3r0L6r]{\foxanddog}`:  

- `\aoverbrace[L50l010105U50l010105R]{\foxanddog}`:  

- `\aunderbrace[l1@{\hspace{5em}}2D2@{\hspace{3em}}1r]{\foxanddog}`:  

- `\aunderbrace[l1R@{\color{red!80!white}}L1r]{\foxanddog}`:  

- `\aoverbrace[L1D!{5em}R]{\foxanddog}`:  


The next question might be how to add content to the brace cusps. Here's a possible way to insert text at the appropriate ratio, using the above construction techniques:



```
\newcommand{\bracetext}[1]{%
  \makebox[0pt][c]{\scriptsize#1}}%
\[
  \overbrace[L2U2D1U1R]{\foxanddog}~{%
    \bracescript{L2r@{\bracetext{left}}l2D1r@{\bracetext{right}}l1R}%
  }%
\]
```

`\bracescript` is provided as part of the `abraces` package and provides a similar `<spec>` construction interface.

Another usage might include “breaking” a brace across lines to indicate a continuous grouping of objects. The following example<sup>2</sup> constructs two open-ended `\aoverbraces` which “spans” multiple lines:

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<sup>2</sup>Taken from the question `\overbrace split accross multiple lines` on the TeX StackExchange network.

$$f(x) = a_0 + a_1x + a_2x^2 + \overbrace{a_3x^3 + a_4x^4 + \cdots + a_{i-1}x^{i-1}}^{\text{some text}} + \overbrace{a_ix^i + a_{i+1}x^{i+1} + \cdots + a_{n-1}x^{n-1}}$$

```
\usepackage{amsmath}% http://ctan.org/pkg/amsmath
%...
\begin{multline*}
f(x)=a_0+a_1x+a_2x^2+
\aoverbrace[L1U1]{a_3x^3+a_4x^4+\cdots+a_{i-1}x^{i-1}+\hspace{1em}}^
{\bracescript{L1r@{\bracetext{some text}}l1}} \\\jot]
\aoverbrace[1R]{\hspace{1em}a_ix^i+a_{i+1}x^{i+1}}+
\cdots+a_{n-1}x^{n-1}
\end{multline*}
```

## 4 Terms of reference

This package originated from a question on the TeX StackExchange network called [Asymmetric overbrace](#). Some code was taken from the `mathtools`<sup>3</sup> package.

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<sup>3</sup>The `mathtools` package: <http://ctan.org/pkg/mathtools>