

# Package: latexSymb (via r-universe)

November 20, 2024

**Type** Package

**Title** Write Equations in a Way that You Can Read

**Version** 0.4.2

**Date** 2024-08-27

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**Description** Utilities to help you write 'LaTeX' in a more readable way. Instead of using plain code or a series of 'newcommand' statements, use 'R' functions. You will be able to write what you mean and make fewer mistakes.

**License** GPL(>= 3)

**Encoding** UTF-8

**VignetteBuilder** knitr, rmarkdown

**Depends** R (>= 4.1.0), purrr

**Suggests** knitr, rmarkdown, testthat (>= 3.0.0)

**Config/testthat/edition** 3

**URL** <https://nicoesve.github.io/latexSymb/>

**BugReports** <https://github.com/nicoesve/latexSymb/issues>

**Repository** <https://nicoesve.r-universe.dev>

**RemoteUrl** <https://github.com/nicoesve/latexsymb>

**RemoteRef** HEAD

**RemoteSha** ba9d2dbfd6d0fd1b9adebac552f29ba5714a0978

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|   |                   |
|---|-------------------|
| + | <i>Arithmetic</i> |
|---|-------------------|

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### Description

There are natural interpretations for doing arithmetic operations on objects of class `latexSymb`. Namely, their output is another object of that class, constructed using the `repr` of the arguments and the corresponding symbol for the operation. These functions implement the elementary ones.

### Usage

```
a + b
a - b
a / b
a * b
a ^ b
under(a,b)
```

### Arguments

|   |   |
|---|---|
| a | An object that can be passed to <code>as.character</code> |
| b | An object that can be passed to <code>as.character</code> |

### Value

An object of class `latex_symb` whose `repr` is:

- For `+` and `-`, the concatenation of `a`'s `repr`, the corresponding arithmetic symbol, and `b`'s `repr`.
- For `*`, the concatenation of the `repr`, with a space between.
- For `/`, `a` and `b`'s `repr` inside `\frac{}{}`.
- For `^`, `a`'s `repr`, a caret and `b`'s `repr` in braces.
- For `under`, `a`'s `repr`, an underscore and `b`'s `repr` in braces

### Examples

```
a <- lsymb("\\alpha")
b <- lsymb("\\beta")
a+b
a-b
a*b
a/b
a^b
under(a,b)
```

**Description**

These functions are used to create operations on functions in LaTeX. They represent evaluation, pullback, pushforward, derivatives and limits of functions.

**Usage**

```
at(f, var)
pback(f)
pfow(f)
dd(f, var)
pp(f, var)
lim(f, var, to = lsymb("\\infty"))
```

**Arguments**

|     |  |
|-----|--|
| f   | latex_symb object representing a function                |
| var | latex_symb object representing a variable                |
| to  | latex_symb object representing the limit of the function |

**Value**

An object of class `latex_symb` whose `repr` is the LaTeX code for the operation applied to the function and the variable.

**Examples**

```
f <- lsymb("f")
x <- lsymb("x")
at(f, x)
pback(f)
pfow(f)
dd(f, x)
pp(f, x)
lim(f, x)
```

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common

*Common latex\_symb objects*

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### Description

A collection of common latex\_symb objects.

### Format

An RData file containing:

**i** latex\_symb object whose repr is "i"  
**j** latex\_symb object whose repr is "j"  
**k** latex\_symb object whose repr is "k"  
**l** latex\_symb object whose repr is "l"  
**m** latex\_symb object whose repr is "m"  
**n** latex\_symb object whose repr is "n"  
**x** latex\_symb object whose repr is "x"  
**y** latex\_symb object whose repr is "y"  
**z** latex\_symb object whose repr is "z"  
**f** latex\_symb object whose repr is "f"  
**g** latex\_symb object whose repr is "g"  
**h** latex\_symb object whose repr is "h"  
**al** latex\_symb object whose repr is "\\alpha"  
**be** latex\_symb object whose repr is "\\beta"  
**ga** latex\_symb object whose repr is "\\gamma"  
**de** latex\_symb object whose repr is "\\delta"  
**ep** latex\_symb object whose repr is "\\epsilon"  
**ze** latex\_symb object whose repr is "\\zeta"  
**et** latex\_symb object whose repr is "\\eta"  
**th** latex\_symb object whose repr is "\\theta"  
**io** latex\_symb object whose repr is "\\iota"  
**ka** latex\_symb object whose repr is "\\kappa"  
**la** latex\_symb object whose repr is "\\lambda"  
**mu** latex\_symb object whose repr is "\\mu"  
**nu** latex\_symb object whose repr is "\\nu"  
**xi** latex\_symb object whose repr is "\\xi"  
**om** latex\_symb object whose repr is "\\omicron"  
**pi.l** latex\_symb object whose repr is "\\pi"

**rh** latex\_symb object whose repr is "\rho"  
**si** latex\_symb object whose repr is "\sigma"  
**ta** latex\_symb object whose repr is "\tau"  
**up** latex\_symb object whose repr is "\upsilon"  
**ph** latex\_symb object whose repr is "\phi"  
**ch** latex\_symb object whose repr is "\chi"  
**ps** latex\_symb object whose repr is "\psi"  
**om** latex\_symb object whose repr is "\omega"  
**des** latex\_symb object whose repr is ":"  
**eq** latex\_symb object whose repr is "="  
**neq** latex\_symb object whose repr is "\neq"  
**lt** latex\_symb object whose repr is "<"  
**gt** latex\_symb object whose repr is ">"  
**leq** latex\_symb object whose repr is "\leq"  
**geq** latex\_symb object whose repr is "\geq"  
**bgs** latex\_symb object whose repr is "\in"  
**mapsto** latex\_symb object whose repr is "\mapsto"  
**to** latex\_symb object whose repr is "\rightarrow"  
**ldots** latex\_symb object whose repr is "\ldots"  
**Reals** latex\_symb object whose repr is "\mathbb{R}"  
**Nats** latex\_symb object whose repr is "\mathbb{N}"  
**Ints** latex\_symb object whose repr is "\mathbb{Z}"  
**Rats** latex\_symb object whose repr is "\mathbb{Q}"  
**Comps** latex\_symb object whose repr is "\mathbb{C}"  
**indic** latex\_symb object whose repr is "\mathbb{1}"  
**infty** latex\_symb object whose repr is "\infty"

### Description

Equations and symbols in LaTeX can be either inline or on their own. `il` wraps expressions for the former, `lenv` for the latter.

### Usage

```

il(x)
lenv(name, rows)

```

**Arguments**

|      |  |
|------|--|
| x    | An object of class <code>latex_symb</code>   |
| name | The name of the LaTeX environment. For instance, <code>align</code> or <code>gather</code> |
| .    |  |
| rows | A list of objects that can be passed to <code>as.character</code> .                        |

**Value**

- For `il`, x's repr surrounded by dollar signs.
- For `lenv`, a multiline string whose lines are: 1. A `\begin` statement for `name`; 2. The character representation of each row; 3. An `\end` statement for `name`

**Examples**

```
al <- lsymb("\\alpha")
be <- lsymb("\\beta")
il(al)
lenv("align",
     c(
       lsymb(al^2 - be^2, "&=", 0, "\\\\"),
       lsymb(pths(al - be)*pths(al + be), "&=", 0)
     )
)
```

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 lsymb

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*Create, print and turn to string objects of class `latex_symb`*


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**Description**

The class `latex_symb` is simply a wrapper for a string with LaTeX code. `lsymb` creates the wrapper, `as.character` and `print` extract the string.

**Usage**

```
lsymb(...)
## S3 method for class 'latex_symb'
print(x, ...)
## S3 method for class 'latex_symb'
as.character(x, ...)
```

**Arguments**

|     |   |
|-----|---|
| ... | Objects that can be passed to <code>as.character</code> . |
| x   | An object of class <code>latex_symb</code>                |

**Value**

- `lsymb` returns an object of class `latex_symb`. It is an S3 class, whose objects are lists with a single component called `repr`. `repr` is the LaTeX code for the object, which is obtained by pasting the character representations of all the arguments.
- `print.lsymb` passes the `repr` of its first argument, plus additional arguments, to `print`. The returned value is whatever `print` returns.
- `as.character.lsymb` passes the `repr` of its first argument, plus additional arguments, to `as.character`. The returned value is whatever `as.character` returns.

**Examples**

```
a1 <- lsymb("\\alpha")
print(a1)
as.character(a1)
```

---

pths

LaTeX *Enclosings*

---

**Description**

It is cumbersome to have to write `left` and `right` every time a grouping is used in LaTeX. These functions take care of that.

**Usage**

```
pths(x)
br(x)
sqbr(x)
ang(x)
```

**Arguments**

`x` An object that can be passed to `as.character`.

**Value**

An object of class `latex_symb` whose `repr` is `x`'s `repr` enclosed by the corresponding symbols.

**Examples**

```
a1 <- lsymb("\\alpha")
pths(a1)
br(a1)
sqbr(a1)
ang(a1)
```

---

Sum

*Cumulative Operators*

---

### Description

These functions are used to create cumulative operators in LaTeX. They take care of the sum, prod and int functions.

### Usage

```
Sum(f, from = lsymb(""), to = lsymb(""))
Prod(f, from = lsymb(""), to = lsymb(""))
Int(f, meas = lsymb("dx"), from = lsymb(""), to = lsymb(""))
```

### Arguments

|      |   |
|------|---|
| f    | An expression to be summed, multiplied or integrated. |
| from | The lower limit of the sum, product or integral.      |
| to   | The upper limit of the sum, product or integral.      |
| meas | The measure of the integral.                          |

### Value

An object of class `latex_symb` whose `repr` is the LaTeX code for the cumulative operator concatenated with the limits and the expression.

### Examples

```
i <- lsymb("i")
n <- lsymb("n")
x <- lsymb("x")
f <- function(x) lsymb("f") * pths(x)
Sum(i, from = 1, to = n)
Prod(i, from = 1, to = n)
Int(f(x), from = 0, to = 1)
```



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