

Package ‘fpCompare’

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Type Package

Title Reliable Comparison of Floating Point Numbers

URL <https://github.com/PredictiveEcology/fpCompare>

Version 0.2.4

Date 2022-08-13

Description Comparisons of floating point numbers are problematic due to errors associated with the binary representation of decimal numbers.

Despite being aware of these problems, people still use numerical methods that fail to account for these and other rounding errors (this pitfall is the first to be highlighted in Circle 1 of Burns (2012)

'The R Inferno' <https://www.burns-stat.com/pages/Tutor/R_inferno.pdf>).

This package provides new relational operators useful for performing floating point number comparisons with a set tolerance.

Depends R (>= 3.4)

Suggests covr, knitr, rmarkdown, testthat

Encoding UTF-8

Language en-CA

License GPL-3

VignetteBuilder knitr

ByteCompile yes

BugReports <https://github.com/PredictiveEcology/fpCompare/issues>

RoxygenNote 7.2.1

NeedsCompilation no

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Repository CRAN

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`%>=%`
Relational operators with tolerance

Description

Binary operators which allow the comparison of values in numeric vectors.

Usage

`x %>=% y`

`x %>>% y`

`x %<=% y`

`x %<<% y`

`x %==% y`

`x %!=% y`

Arguments

`x` Any numeric object.

`y` Any numeric object.

Details

These are similar to their counterparts in base, except a tolerance `fpCompare.tolerance` can be specified via options to account for floating point rounding errors:

<code>fpCompare</code>	base
<code>%>=%</code>	<code>>=</code>
<code>%>>%</code>	<code>></code>
<code>%<=%</code>	<code><=</code>
<code>%<<%</code>	<code><</code>
<code>%==%</code>	<code>==</code>
<code>%!=%</code>	<code>!=</code>

Inspired by R FAQ 7.31 (https://cran.r-project.org/doc/FAQ/R-FAQ.html#Why-doesn_0027t-R-think-these-num_003f) and this post (<https://stackoverflow.com/a/2769618/1380598>).

Value

A logical vector indicating the result of the element by element comparison. The elements of shorter vectors are recycled as necessary.

Author(s)

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See Also

[all.equal](#), [.Machine](#)

Examples

```
x1 <- 0.5 - 0.3
x2 <- 0.3 - 0.1
x1 == x2                # FALSE on most machines
x1 %==% x2              # TRUE everywhere
identical(all.equal(x1, x2), TRUE) # TRUE everywhere
```

```
set.seed(123)
a <- 1:6
b <- jitter(1:6, 1e-7)
print(rbind(a, b), digits = 16)
```

```
b %<=% a
b %<<% a
b %>=% a
b %>>% a
b %==% a
b %!=% a
```

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