

# Package ‘fracture’

July 22, 2025

**Title** Convert Decimals to Fractions

**Version** 0.2.1

**Description** Provides functions for converting decimals to a matrix of numerators and denominators or a character vector of fractions. Supports mixed or improper fractions, finding common denominators for vectors of fractions, limiting denominators to powers of ten, and limiting denominators to a maximum value. Also includes helper functions for finding the least common multiple and greatest common divisor for a vector of integers. Implemented using C++ for maximum speed.

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**URL** <https://fracture.rossellhayes.com/>,  
<https://github.com/rossellhayes/fracture>

**BugReports** <https://github.com/rossellhayes/fracture/issues>

**Depends** R (>= 2.10)

**Imports** Rcpp

**Suggests** covr, testthat (>= 3.0.0), withr

**LinkingTo** Rcpp

**Encoding** UTF-8

**RoxygenNote** 7.2.0

**SystemRequirements** C++11

**Config/testthat/edition** 3

**NeedsCompilation** yes

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**Repository** CRAN

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Contents

|                      |          |
|----------------------|----------|
| fracture . . . . .   | 2        |
| frac_lcm . . . . .   | 3        |
| frac_mat . . . . .   | 4        |
| frac_style . . . . . | 6        |
| <b>Index</b>         | <b>7</b> |

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|----------|------------------------------------------------------------|
| fracture | <i>Convert decimals to a character vector of fractions</i> |
|----------|------------------------------------------------------------|

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Description

Convert decimals to a character vector of fractions

Usage

```
fracture(  
  x,  
  ...,  
  denom = NULL,  
  base_10 = FALSE,  
  common_denom = FALSE,  
  mixed = FALSE,  
  max_denom = 1e+07  
)  
  
as.fracture(x)  
  
is.fracture(x)
```

Arguments

|              |                                                                                                                                                                                                                                                  |
|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| x            | A vector of decimals or, for <code>as.fracture()</code> , a matrix created by <code>frac_mat()</code>                                                                                                                                            |
| ...          | These dots are for future extensions and must be empty.                                                                                                                                                                                          |
| denom        | If <code>denom</code> is not <code>NULL</code> , all fractions will have a denominator of <code>denom</code> . This will ignore all other arguments that affect the denominator.                                                                 |
| base_10      | If <code>TRUE</code> , all denominators will be a power of 10.                                                                                                                                                                                   |
| common_denom | If <code>TRUE</code> , all fractions will have the same denominator.<br>If the least common denominator is greater than <code>max_denom</code> , <code>max_denom</code> is used.                                                                 |
| mixed        | If <code>TRUE</code> , integer components will be displayed separately from fractional components for <code>x</code> values greater than 1.<br>If <code>FALSE</code> , improper fractions will be used for <code>x</code> values greater than 1. |

**max\_denom** All denominators will be less than or equal to max\_denom.  
 If base\_10 is TRUE, the maximum denominator will be the largest power of 10 less than max\_denom.  
 A max\_denom greater than the inverse square root of [machine double epsilon](#) will produce a warning because floating point rounding errors can occur when denominators grow too large.

### Value

A character vector.

### See Also

[frac\\_mat\(\)](#) to return a matrix of numerators and denominators.

### Examples

```
x <- (6:1) / (1:6)

fracture(x)
fracture(x, common_denom = TRUE)

fracture(x, base_10 = TRUE)
fracture(x, base_10 = TRUE, max_denom = 100)
fracture(x, base_10 = TRUE, common_denom = TRUE)
fracture(x, base_10 = TRUE, common_denom = TRUE, max_denom = 100)

fracture(x, mixed = TRUE)
fracture(x, mixed = TRUE, common_denom = TRUE)
fracture(x, mixed = TRUE, base_10 = TRUE)
fracture(x, mixed = TRUE, base_10 = TRUE, max_denom = 100)
fracture(x, mixed = TRUE, base_10 = TRUE, common_denom = TRUE)
fracture(x, mixed = TRUE, base_10 = TRUE, common_denom = TRUE, max_denom = 100)
```

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frac\_lcm

*Least common multiple and greatest common divisor*

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### Description

Least common multiple and greatest common divisor

### Usage

```
frac_lcm(..., max = 1e+07)

frac_gcd(...)
```

**Arguments**

... Integer vectors or vectors that can be coerced to integer.

max If the least common multiple is greater than max, max is returned instead.

**Value**

An integer.

**Examples**

```
frac_lcm(1, 2, 3, 4, 5, 6)
x <- 1:6
frac_lcm(x)
frac_lcm(x, 7)

frac_gcd(12, 42, 60)
y <- c(12, 42, 60)
frac_gcd(y)
frac_gcd(y, 39)
```

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frac\_mat

---

*Convert decimals to a matrix of numerators and denominators*


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**Description**

Convert decimals to a matrix of numerators and denominators

**Usage**

```
frac_mat(
  x,
  ...,
  denom = NULL,
  base_10 = FALSE,
  common_denom = FALSE,
  mixed = FALSE,
  max_denom = 1e+07
)

as.frac_mat(x)

is.frac_mat(x)
```

**Arguments**

|              |                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| x            | A vector of decimals or, for <code>as.frac_mat()</code> , a character vector created by <code>fracture()</code>                                                                                                                                                                                                                                                                                                                        |
| ...          | These dots are for future extensions and must be empty.                                                                                                                                                                                                                                                                                                                                                                                |
| denom        | If <code>denom</code> is not <code>NULL</code> , all fractions will have a denominator of <code>denom</code> . This will ignore all other arguments that affect the denominator.                                                                                                                                                                                                                                                       |
| base_10      | If <code>TRUE</code> , all denominators will be a power of 10.                                                                                                                                                                                                                                                                                                                                                                         |
| common_denom | If <code>TRUE</code> , all fractions will have the same denominator.<br>If the least common denominator is greater than <code>max_denom</code> , <code>max_denom</code> is used.                                                                                                                                                                                                                                                       |
| mixed        | If <code>TRUE</code> , integer components will be displayed separately from fractional components for <code>x</code> values greater than 1.<br>If <code>FALSE</code> , improper fractions will be used for <code>x</code> values greater than 1.                                                                                                                                                                                       |
| max_denom    | All denominators will be less than or equal to <code>max_denom</code> .<br>If <code>base_10</code> is <code>TRUE</code> , the maximum denominator will be the largest power of 10 less than <code>max_denom</code> .<br>A <code>max_denom</code> greater than the inverse square root of <code>machine double epsilon</code> will produce a warning because floating point rounding errors can occur when denominators grow too large. |

**Value**

A matrix with the same number of columns as the length of `x` and rows for integers (if `mixed` is `TRUE`), numerators, and denominators.

**See Also**

`fracture()` to return a character vector of fractions.

**Examples**

```
x <- (6:1) / (1:6)

frac_mat(x)
frac_mat(x, common_denom = TRUE)

frac_mat(x, base_10 = TRUE)
frac_mat(x, base_10 = TRUE, max_denom = 100)
frac_mat(x, base_10 = TRUE, common_denom = TRUE)
frac_mat(x, base_10 = TRUE, common_denom = TRUE, max_denom = 100)

frac_mat(x, mixed = TRUE)
frac_mat(x, mixed = TRUE, common_denom = TRUE)
frac_mat(x, mixed = TRUE, base_10 = TRUE)
frac_mat(x, mixed = TRUE, base_10 = TRUE, max_denom = 100)
frac_mat(x, mixed = TRUE, base_10 = TRUE, common_denom = TRUE)
frac_mat(x, mixed = TRUE, base_10 = TRUE, common_denom = TRUE, max_denom = 100)
```

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|------------|----------------------------------------------------------|
| frac_style | <i>Style a fracture with superscripts and subscripts</i> |
|------------|----------------------------------------------------------|

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**Description**

Uses Unicode superscripts and subscripts to format a fracture.

**Usage**

```
frac_style(fracture, ...)
```

**Arguments**

|          |                                                                                     |
|----------|-------------------------------------------------------------------------------------|
| fracture | A <a href="#">fracture</a> or a vector to be passed to <a href="#">fracture()</a> . |
| ...      | Additional arguments passed to <a href="#">fracture()</a> .                         |

**Value**

fracture with numerators formatted with Unicode superscripts and denominators formatted with Unicode subscripts.

**Examples**

```
frac_style(fracture(0.5))  
frac_style(fracture(c(0.5, 1.5), mixed = TRUE))
```

# Index

`as.frac_mat (frac_mat)`, 4  
`as.fracture (fracture)`, 2

`frac_gcd (frac_lcm)`, 3  
`frac_lcm`, 3  
`frac_mat`, 4  
`frac_mat()`, 2, 3  
`frac_style`, 6  
`fracture`, 2, 6  
`fracture()`, 5, 6

`is.frac_mat (frac_mat)`, 4  
`is.fracture (fracture)`, 2

machine double epsilon, 3, 5

NULL, 2, 5