Package 'birk'

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Type Package

Title MA Birk's Functions

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Description This is a compilation of functions that I found useful to make. It currently includes a unit of measurement conversion function, a Q10 calculator for temperature dependence of chemical and biological rates, and some miscellaneous wrapper functions to make R code shorter and faster to write.

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`birk` *NA*

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Author(s)

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conv_unit *Convert Units of Measurement*

Description

Converts common units of measurement for a variety of dimensions. See conv_unit_options for all options.

Usage

```
conv_unit(x, from, to)
```

Arguments

x	the measurement value or vector of values in its original units.
from	the unit in which the measurement was made.
to	the unit to which the measurement is to be converted.

Details

Acceleration mm_per_sec2, cm_per_sec2, m_per_sec2, km_per_sec2, grav, inch_per_sec2, ft_per_sec2, mi_per_sec2

Angle degree, radian, grad, arcmin, arcsec, turn

Area nm2, um2, mm2, cm2, m2, hectare, km2, inch2, ft2, yd2, acre, mi2, naut_mi2

Coordinate dec_deg, deg_dec_min, deg_min_sec (see note)

Duration nsec, usec, msec, sec, min, hr, day, wk, mon, yr, dec, cen, mil

Energy J, erg, cal, Cal, Wsec, kWh, MWh, BTU

Flow ml_per_sec, ml_per_min, ml_per_hr, l_per_sec, l_per_min, l_per_hr, m3_per_sec, m3_per_min, m3_per_hr, gal_per_sec, gal_per_min, gal_per_hr, ft3_per_sec, ft3_per_min, ft3_per_hr

Length angstrom, nm, um, mm, cm, dm, m, km, inch, ft, yd, mi, naut_mi, au, light_yr

Mass ug, mg, g, kg, metric_ton, oz, lbs, short_ton, long_ton, stone

Power uW, mW, W, kW, MW, GW, erg_per_sec, cal_per_sec, cal_per_hr, Cal_per_sec, Cal_per_hr, BTU_per_sec, BTU_per_hr, hp

Pressure uatm, atm, Pa, hPa, kPa, torr, mmHg, inHg, mbar, bar, dbar, psi

Speed mm_per_sec, cm_per_sec, m_per_sec, km_per_sec, inch_per_sec, ft_per_sec, kph, mph, knot, mach, light

Temperature C, F, K, R

Volume ul, ml, dl, l, cm3, dm3, m3, us_tsp, us_tbsp, us_oz, us_cup, us_pint, us_quart, us_gal, inch3, ft3, imp_tsp, imp_tbsp, imp_oz, imp_pint, imp_quart, imp_gal

The conversion values have been defined based primarily from international weight and measurement authorities (e.g. General Conference on Weights and Measures, International Committee for Weights and Measures, etc.). While much effort was made to make conversions as accurate as possible, you should check the accuracy of conversions to ensure that conversions are precise enough for your applications.

Note

Duration Years are defined as 365.25 days and months are defined as 1/12 a year.

Coordinate Values must be entered as a string with one space between subunits (e.g. 70° 33' 11" = "70 33 11").

Energy cal is a thermochemical calorie (4.184 J) and Cal is 1000 cal (kcal or 4184 J).

Mass All non-metric units are based on the avoirdupois system.

Power hp is mechanical horsepower, or 745.69 W.

Speed mach is calculated at sea level at 15 °C.

Author(s)

Matthew A. Birk, <matthewabirk@gmail.com>

See Also

conv_unit_options

Examples

```
conv_unit(2.54, cm, inch) # Result = 1 inch
conv_unit(seq(1, 10), kg, short_ton) # A vector of measurement values can be converted
conv_unit("33 1 1", deg_min_sec, dec_deg)
conv_unit(c("101 44.32","3 19.453"), deg_dec_min, deg_min_sec)
```

---

conv_unit_options *Unit of Measurement Conversion Options*

Description

Shows what units of measurement can be converted with the function conv_unit.

Usage

```
conv_unit_options
```

Format

A list with all units available for conversion using conv_unit.

Details

Duration Years are defined as 365.25 days and months are defined as 1/12 a year.

Coordinate Values must be entered as a string with one space between subunits (e.g. 70° 33' 11" = "70 33 11").

Energy cal is a thermochemical calorie (4.184 J) and Cal is 1000 cal (kcal or 4184 J).

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The conversion values have been defined based primarily from international weight and measurement authorities (e.g. General Conference on Weights and Measures, International Committee for Weights and Measures, etc.). While much effort was made to make conversions as accurate as possible, you should check the accuracy of conversions to ensure that conversions are precise enough for your applications.

See Also

conv_unit

Examples

```
conv_unit_options
conv_unit_options['Pressure']
```

---

geom_mean *Geometric Mean*

Description

Computes the geometric mean of a vector, x. It is a wrapper for exp(mean(log(x))).

Usage

```
geom_mean(x, add0.001 = FALSE, ignore_neg = FALSE, ...)
```

Arguments

x	a numeric vector or an R object which is coercible to one by as.vector(x, "numeric").
add0.001	logical. Should a small constant (0.001) be added to avoid issues with zeroes?
ignore_neg	logical. Should negative values be ignored to avoid NaNs?
...	further arguments passed to mean.

Author(s)

Matthew A. Birk, <matthewabirk@gmail.com>

See Also

mean

Examples

```
geom_mean(1:10)
geom_mean(0:10)
geom_mean(0:10, add0.001 = TRUE)
geom_mean(-10:10, add0.001 = TRUE, ignore_neg = TRUE)
```

Q10calc *Parameters of Q10 Temperature Coefficient*

Description

Returns the unknown parameter given 4 of 5 parameters from Q10 temperature coefficient calculation for chemical or biological systems.

Usage

```
Q10calc(Q10, R2, R1, T2, T1)
```

Arguments

Q10	factor by which rate changes due to 10° C increase in temperature.
R2	rate 2.
R1	rate 1.
T2	temperature 2 (in °C).
T1	temperature 1 (in °C).

Details

Given four parameters, the fifth parameter will be returned.

Author(s)

Matthew A. Birk, <matthewabirk@gmail.com>

Examples

```
Q10calc(R2 = 10, R1 = 5, T2 = 20, T1 = 10) # Returns Q10; = 2
Q10calc(Q10 = 2.66, R1 = 5, T2 = 20, T1 = 10) # Returns R2; = 13.3
```

range_seq *Sequence Generation Spanning A Numerical Range*

Description

Generates a sequence of numbers spanning the range of x.

Usage

```
range_seq(x, extend = 0, ...)
```

Arguments

x	a numeric vector.
extend	number specifying the fraction by which the range should be extended.
...	further arguments to be passed to seq.

Author(s)

Matthew A. Birk, <matthewabirk@gmail.com>

See Also

seq, extendrange

Examples

```
range_seq(rnorm(10, sd = 20))
range_seq(c(3, 9), extend = 0.1)
range_seq(c(3, 9), length.out = 20)
```

---

se *Standard Error*

Description

Computes the standard error of the values in x. If na.rm is TRUE then missing values are removed before computation proceeds.

Usage

```
se(x, na.rm = FALSE)
```

Arguments

x	a numeric vector or an R object which is coercible to one by as.vector(x, "numeric").
na.rm	logical. Should missing values be removed?

Author(s)

Matthew A. Birk, <matthewabirk@gmail.com>

See Also

sd, var

Examples

```
se(1:10)
```

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