

Package ‘gower’

May 14, 2019

Maintainer Mark van der Loo <mark.vanderloo@gmail.com>

License GPL-3

Title Gower's Distance

LazyData no

Type Package

LazyLoad yes

Description Compute Gower's distance (or similarity) coefficient between records. Compute the top-n matches between records. Core algorithms are executed in parallel on systems supporting OpenMP.

Version 0.2.1

URL <https://github.com/markvanderloo/gower>

BugReports <https://github.com/markvanderloo/gower/issues>

Suggests tinytest (>= 0.9.3),

RoxygenNote 6.1.1

NeedsCompilation yes

Author Mark van der Loo [aut, cre],
David Turner [ctb]

Repository CRAN

Date/Publication 2019-05-14 21:00:23 UTC

R topics documented:

gower-package	2
gower_dist	2
gower_topn	3

Index	5
--------------	----------

gower-package	<i>Gower's distance/similarity measure.</i>
---------------	---

Description

A C-based implementation of Gower's distance.

gower_dist	<i>Gower's distance</i>
------------	-------------------------

Description

Compute Gower's distance, pairwise between records in two data sets `x` and `y`. Records from the smallest data set are recycled over.

Usage

```
gower_dist(x, y, pair_x = NULL, pair_y = NULL, eps = 1e-08,
           weights = NULL, ignore_case = FALSE,
           nthread = getOption("gd_num_thread"))
```

Arguments

<code>x</code>	[data.frame]
<code>y</code>	[data.frame]
<code>pair_x</code>	[numeric character] (optional) Columns in <code>x</code> used for comparison. See Details below.
<code>pair_y</code>	[numeric character] (optional) Columns in <code>y</code> used for comparison. See Details below.
<code>eps</code>	[numeric] (optional) Computed numbers (variable ranges) smaller than <code>eps</code> are treated as zero.
<code>weights</code>	[numeric] (optional) A vector of weights of length <code>ncol(x)</code> that defines the weight applied to each component of the gower distance.
<code>ignore_case</code>	[logical] Toggle ignore case when neither <code>pair_x</code> nor <code>pair_y</code> are user-defined.
<code>nthread</code>	Number of threads to use for parallelization. By default, for a dual-core machine, 2 threads are used. For any other machine <code>n-1</code> cores are used so your machine doesn't freeze during a big computation. The maximum nr of threads are determined using <code>omp_get_max_threads</code> at C level.

Value

A numeric vector of length `max(nrow(x), nrow(y))`. When there are no columns to compare, a message is printed and both `numeric(0)` is returned invisibly.

Details

There are three ways to specify which columns of x should be compared with what columns of y . The first option is do give no specification. In that case columns with matching names will be used. The second option is to use only the `pairs_y` argument, specifying for each column in x in order, which column in y must be used to pair it with (use \emptyset to skip a column in x). The third option is to explicitly specify the columns to be matched using `pair_x` and `pair_y`.

Note

Gower (1971) originally defined a similarity measure (s , say) with values ranging from 0 (completely dissimilar) to 1 (completely similar). The distance returned here equals $1 - s$.

References

Gower, John C. "A general coefficient of similarity and some of its properties." *Biometrics* (1971): 857-871.

See Also

[gower_topn](#)

gower_topn	<i>Find the top-n matches</i>
------------	-------------------------------

Description

Find the top-n matches in y for each record in x .

Usage

```
gower_topn(x, y, pair_x = NULL, pair_y = NULL, n = 5, eps = 1e-08,
           weights = NULL, ignore_case = FALSE,
           nthread = getOption("gd_num_thread"))
```

Arguments

<code>x</code>	[data.frame]
<code>y</code>	[data.frame]
<code>pair_x</code>	[numeric character] (optional) Columns in x used for comparison. See Details below.
<code>pair_y</code>	[numeric character] (optional) Columns in y used for comparison. See Details below.
<code>n</code>	The top-n indices and distances to return.
<code>eps</code>	[numeric] (optional) Computed numbers (variable ranges) smaller than <code>eps</code> are treated as zero.

weights	[numeric] (optional) A vector of weights of length ncol(x) that defines the weight applied to each component of the gower distance.
ignore_case	[logical] Toggle ignore case when neither pair_x nor pair_y are user-defined.
nthread	Number of threads to use for parallelization. By default, for a dual-core machine, 2 threads are used. For any other machine n-1 cores are used so your machine doesn't freeze during a big computation. The maximum nr of threads are determined using omp_get_max_threads at C level.

Value

A list with two array elements: `index` and `distance`. Both have size `n X nrow(x)`. Each `i`th column corresponds to the top-`n` best matches of `x` with rows in `y`. When there are no columns to compare, a message is printed and both `distance` and `index` will be empty matrices; the list is then returned invisibly.

See Also

[gower_dist](#)

Examples

```
# find the top 4 best matches in the iris data set with itself.
x <- iris[1:3,]
lookup <- iris[1:10,]
gower_topn(x=x,y=lookup,n=4)
```

Index

[gower-package](#), [2](#)
[gower_dist](#), [2](#), [4](#)
[gower_topn](#), [3](#), [3](#)