Package 'mclustcomp'

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Type Package

Title Measures for Comparing Clusters

Version 0.3.3

Description Given a set of data points, a clustering is defined as a disjoint partition where each pair of sets in a partition has no overlapping elements. This package provides 25 methods that play a role somewhat similar to distance or metric that measures similarity of two clusterings - or partitions. For a more detailed description, see Meila, M. (2005) <doi:10.1145/1102351.1102424>.

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mclustcomp-package *Measures for Comparing Clusterings*

Description

Given a set of data points D, a clustering $C = (C_1, C_2, ..., C_k)$ is a partition where each pair of sets C_i and C_j has no overlapping elements. **mclustcomp** package provides a collection of methods that play a role similar to *distance* or *metric* in that measures similarity of two clusterings (or, partitions) C and C'. For a more detailed description, see Meila, M. (2005) <doi:10.1145/1102351.1102424>.

mclustcomp *Measures for Comparing Clusterings*

Description

Given two partitions or clusterings C_1 and C_2, it returns community comparison scores corresponding with a set of designated methods. Note that two label vectors should be of same length having either numeric or factor type. Currently we have 3 classes of methods depending on methodological philosophy behind each. See below for the taxonomy.

Usage

```
mclustcomp(x, y, types = "all", tversky.param = list())
```

Arguments

x, y	vectors of clustering labels
types	"all" for returning scores for every available measure. Either a single score name or a vector of score names can be supplied. See the section for the list of the methods for details.
tversky.param	a list of parameters for Tversky index; alpha and beta for weight parameters, and sym, a logical where FALSE stands for original method, TRUE for a revised variant to symmetrize the score. Default (alpha,beta)=(1,1).

Value

a data frame with columns types and corresponding scores.

Category 1. Counting Pairs

TYPE	FULL NAME
'adjrand'	Adjusted Rand index.
'chisq'	Chi-Squared Coefficient.
'fmi'	Fowlkes-Mallows index.
'jaccard'	Jaccard index.
'mirkin'	Mirkin Metric, or Equivalence Mismatch Distance.
'overlap'	Overlap Coefficient, or Szymkiewicz-Simpson coefficient.
'pd'	Partition Difference.
'rand'	Rand Index.
'sdc'	Sørensen–Dice Coefficient.
'smc'	Simple Matching Coefficient.
'tanimoto'	Tanimoto index.
'tversky'	Tversky index.
'wallace1'	Wallace Criterion Type 1.
'wallace2'	Wallace Criterion Type 2.

Note that Tanimoto Coefficient and Dice's coefficient are special cases with (alpha,beta) = (1,1) and (0.5,0.5), respectively.

Category 2. Set Overlaps/Matching

TYPE	FULL NAME
'f'	F-Measure.
'mhm'	Meila-Heckerman Measure.
'mmm'	Maximum-Match Measure.
'vdm'	Van Dongen Measure.

Category 3. Information Theory

TYPE	FULL NAME
'jent'	Joint Entropy
'mi'	Mutual Information.
'nmi1'	Normalized Mutual Information by Strehl and Ghosh.
'nmi2'	Normalized Mutual Information by Fred and Jain.
'nmi3'	Normalized Mutual Information by Danon et al.
'nvi'	Normalized Variation of Information.
'vi'	Variation of Information.

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Examples

```
## example 1. compare two identical clusterings
x = sample(1:5,20,replace=TRUE) # label from 1 to 5, 10 elements
y = x                           # set two labels x and y equal
mclustcomp(x,y)                 # show all results

## example 2. selection of a few methods
z = sample(1:4,20,replace=TRUE)           # generate a non-trivial clustering
cmethods = c("jaccard","tanimoto","rand") # select 3 methods
mclustcomp(x,z,types=cmethods)            # test with the selected scores

## example 3. tversky.param
tparam = list()                           # create an empty list
tparam$alpha = 2
tparam$beta  = 3
tparam$sym   = TRUE
mclustcomp(x,z,types="tversky")           # default set as Tanimoto case.
mclustcomp(x,z,types="tversky",tversky.param=tparam)
```

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