

Package ‘quickPWCR’

January 13, 2025

Type Package

Title Quickly Construct and Rate Large Binary Pairwised Comparisons

Version 1.2

Date 2025-01-12

Description A collection of functions for constructing large pairwised comparisons and rating them using Elo rating system with supporting parallel processing. The method of random sample pairs is based on Reservoir Sampling proposed by Jitter (1985) <[doi:10.1145/3147.3165](https://doi.org/10.1145/3147.3165)>.

License GPL-3

Encoding UTF-8

RxygenNote 7.3.1

Language en-US

Suggests testthat (>= 3.0.0), knitr, rmarkdown

VignetteBuilder knitr, rmarkdown

Imports Rcpp, parallel, pbmcapply, dplyr

LinkingTo Rcpp

NeedsCompilation yes

Author Xiaohao Yang [aut, cre, cph]

Maintainer Xiaohao Yang <xiaohaoy@umich.edu>

Repository CRAN

Date/Publication 2025-01-13 14:10:06 UTC

Contents

m_elo	2
randompair	3
Index	4

 m_elo

randompair

Description

randomly pair players using reservoir sampling method.

Usage

```
m_elo(
  df_pw,
  wl,
  elo_randomisations = 500,
  initial_rating = 0,
  k = 100,
  cores = 1
)
```

Arguments

df_pw	dataframe, indicating a dataframe that includes the columns of winners and losers.
wl	vector, indicating the column names of winners and losers (c('w', 'l')). The first column name is for winners and the second column name is for losers.
elo_randomisations	numeric, indicating the number of interactions that the Elo rating system is run with the randomized pairwise comparisons
initial_rating	The initial rating of the players at the beginning
k	numeric, the K-factor determines the amount of change to the updated ratings
cores	numeric, indicating the number of CUP cores to be used for parallel processing

Value

dataframe

References

Glickman, M. E., & Jones, A. C. (1999). Rating the chess rating system. CHANCE-BERLIN THEN NEW YORK-, 12, 21-28.

Examples

```
df <- data.frame(a = c(1,6,0,4,'a','v',9,'n'), b = c('w',3,5,2,'d','j',8,'p'))
pw <- quickPWCR::m_elo(df_pw = df,
  wl = c('a', 'b'),
  elo_randomisations = 100,
  initial_rating = 1000,
```

```
k = 100,  
cores = 1)
```

randompair

randompair

Description

randomly pair players using reservoir sampling method.

Usage

```
randompair(players, k, cores = 1)
```

Arguments

players	vector, indicating a list of players.
k	numeric, indicating how many players each player will be paired with.
cores	numeric, indicating the number of CUP cores to be used for parallel

Value

dataframe

References

JVitter, J. S. (1985). Random sampling with a reservoir. *ACM Transactions on Mathematical Software (TOMS)*, 11(1), 37-57.

Examples

```
players <- c(1, 'a', 'c', 4, 7, 2, 'w', 'y', 3, 0, 8)  
pw <- quickPWCR::randompair(players = players, k = 3)
```

Index

`m_elo`, 2

`randompair`, 3