

# Package ‘quickPWCR’

April 25, 2024

**Type** Package

**Title** Quickly construct and rating large binary pairwiesd comparisons

**Version** 1.0

**Date** 2024-04-23

**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 JVitter (1985) <[doi:10.1145/3147.3165](https://doi.org/10.1145/3147.3165)>.

**License** GPL-3

**Encoding** UTF-8

**RoxygenNote** 7.3.1

**Language** en\_GB

**Suggests** testthat (>= 3.0.0), knitr, rmarkdown

**VignetteBuilder** knitr, rmarkdown

**Imports** Rcpp, parallel, pbmcapply, dplyr

**LinkingTo** Rcpp

**NeedsCompilation** yes

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**Repository** CRAN

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m_elo	<i>randompair</i>
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### 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)
```

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randompair

*randompair*

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### **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)
```

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