Package 'evenBreak'

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Title A Posteriori Probs of Suits Breaking Evenly Across Four Hands

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Depends R (>= 4.2.0)

Imports combinat, graphics, stats, utils

Description We quantitatively evaluated the assertion that says if one suit is found to be evenly distributed among the 4 players, the rest of the suits are more likely to be evenly distributed. Our mathematical analyses show that, if one suit is found to be evenly distributed, then a second suit has a slightly elevated probability (ranging between 10% to 15%) of being evenly distributed. If two suits are found to be evenly distributed, then a third suit has a substantially elevated probability (ranging between 30% to 50%) of being evenly distributed.This package refers to methods and authentic data from Ely Culbertson <https://www.bridgebum.com/law_of_symmetry.php>, Gregory Stoll <https://gregstoll.com/~gregstoll/bridge/math.html>, and details of performing the probability calculations from Jeremy L. Martin <https://jlmartin.ku.edu/~jlmartin/bridge/basics.pdf>, Emile Borel and Andre Cheron (1954) ``The Mathematical Theory of Bridge",Antonio Vivaldi and Gianni Barracho (2001, ISBN:0 7134 8663 5) ``Probabilities and Alternatives in Bridge", Ken Monzingo (2005) ``Hand and Suit Patterns" <http://web2.acbl.org/documentlibrary/teachers/celebritylessons/handpatternsrevised.pdf>Ken Monzingo (2005) ``Hand and Suit Patterns" <http://web2.acbl.org/documentlibrary/teachers/celebritylessons/handpatternsrevised.pdf>.

License GPL (>= 2)

Encoding UTF-8

VignetteBuilder knitr

Suggests knitr, rmarkdown, testthat (>= 3.0.0)

RoxygenNote 7.3.1

Config/testthat/edition 3

NeedsCompilation no

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Contents

`compareProbs` *compareProbs*

Description

organizes invoking evenBreakDriver() for 4 deck sizes, and presenting the results in a table and in a graph scatter plot of 2 sets of distribution probabilities

Usage

```
compareProbs(verbose)
```

Arguments

`verbose`	Boolean if TRUE print output data

Value

returns no value, but has side effects of printing a table and a graph
of the probability of a given distribution of a single suit across 4 hands,
conditioned on the number of suits that are known to be evenly distributed.

Author(s)

Barry Zeeberg

Examples

```
compareProbs()
```

evenBreak *evenBreak*

Description

compute the probability of a given distribution of a single suit across 4 hands

Usage

```
evenBreak(D4,n1,n2,n3,PERM)
```

Arguments

D4	one quarter of the size of the deck, normally = 13
n1	the number of cards in the suit in the hands of player 1
n2	the number of cards in the suit in the hands of player 2
n3	the number of cards in the suit in the hands of player 3
PERM	the number of permutations

Value

returns the probability of a given distribution of a single suit across 4 hands

Author(s)

Barry Zeeberg

Examples

```
n1<-3
n2<-3
n3<-3
n4<-13-(n1+n2+n3)
PERM<-length(unique(combinat::permn(c(n1,n2,n3,n4))))
PERM
evenBreak(13,n1,n2,n3,1)*length(unique(combinat::permn(c(n1,n2,n3,n4))))
```

`evenBreakDriver` *evenBreakDriver*

Description

loop through all possible distributions of a single suit across 4 hands

Usage

```
evenBreakDriver(D4)
```

Arguments

`D4`	one quarter of the size of the deck, normally = 13

Value

returns a table of the probability of a given distribution of a single suit across 4 hands, conditioned on the number of suits that are known to be evenly distributed.

Author(s)

Barry Zeeberg

Examples

```
evenBreakDriver(13)
```

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