Package ‘bridger’

October 12, 2022

Type    Package
Title   Bridge Hand Generator with Criteria Selector
Version 0.1.0
Author Jason Kaplan [aut, cre]
URL     https://github.com/CommoditiesAI/bridger
Maintainer Jason Kaplan <scjase@gmail.com>
Description Produce bridge hands, allowing parameters for hands to offer specific for bidding sequences.
License GPL (>= 3)
Encoding UTF-8
RoxygenNote 7.1.1
Imports cowplot, dplyr, patchwork, tibble, tidyr, magrittr, ggplot2, ggridit, glue, gridExtra, kableExtra, pdf tools, scales, stringr
SystemRequirements LaTeX(texi2dvi) must be present in the system to create PDF reports
Depends R (>= 2.10)
Suggests spelling
Language en-US
NeedsCompilation no
Repository CRAN
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### Description

Runs on loading bridger

### Usage

`.onLoad(libname, pkgname)`

### Arguments

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<tr>
<th>Argument</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>libname</code></td>
<td>Legacy dummy</td>
</tr>
<tr>
<td><code>pkgname</code></td>
<td>Legacy dummy</td>
</tr>
</tbody>
</table>

### Value

No return value, called to set global variables and specify import packages
**Description**

Generate a bridge hand

**Usage**

```
bridgeHand(
    handNumber = "auto",
    seat = FALSE,
    createGraphic = TRUE,
    LTC = "original",
    ...
)
```

**Arguments**

- **handNumber**: An integer for generating a hand, or "auto" to use a random number generator
- **seat**: If not false, makes the specified seat South and dealer, so all bidding starts with South and the specified hand type
- **createGraphic**: Whether the graphic should be created
- **LTC**: Whether to include losing trick count - FALSE for none, "original" or "new" for schema
- **...**: Other parameters used in hand evaluation

**Value**

List: Hand ID, Dealer, Hand graphic, Hand points, Hand shape, vulnerability

**Note**

To change the hand evaluation pass high card values (HCValues) and shape values (shapeValues) in the arguments.

HCValues is a string of five digits specifying the value of the Ace, King, Queen, Jack and 10. The default is the Milton Work scale of 4, 3, 2, 1, 0. shapeValues is a string of eight digits specifying the value of a suit with no cards/"Void", 1-card/"Singleton", ... 7-cards. The default is c(3, 2, 1, 0, 0, 1, 2, 3) Losing Trick Count (LTCSchema) 'Original' or 'New' as described at https://en.wikipedia.org/wiki/Losing-Trick_Count. This assumes a fit will be found. It is currently not implemented.
Examples

## Not run:
# Produce a bridge hand
hand <- bridgeHand()

# Produce a bridge hand '500' ensuring South as dealer
hand500 <- bridgeHand(handNumber = 500, seat = "S") # Seat can be any compass point

## End(Not run)

collectHands

description

Returns a list of hands that fit a requirement. Simple hands will most often give the required bids. Complex hands, where a subsequent bid is made, may not fit the requirements, as other bids by opponents or partner may be preferable to the desired bidding pattern.

Usage

collectHands(handType = "opener", num = 6, ...)

Arguments

handType Type of hands wanted
num Number of hands requested
... Other parameters to be passed to the find_functions, e.g. HC_low, cardLen_low

Value

Tibble - One line per requested hand with hand ID, seat position and type of hand

Note

Each of the handTypes is a standard set of parameters. For example "NT" (alias "balanced") allows 12-14 points, a single doubleton and no 5-card majors and no 6-card minor. To change these parameters then optional parameters can be passed through the "...". The most common changes will be to specify the low and high high-card range and the shortest allowed suit and longest allowed. These are "HC_low" and "HC_high", "cardLen_low" and "cardLen_high" respectively.

Existing functions and key parameters are currently:

<table>
<thead>
<tr>
<th>Single bids</th>
<th>HC_low</th>
<th>HC_high</th>
<th>cardLen_low</th>
<th>cardLen_high</th>
</tr>
</thead>
<tbody>
<tr>
<td>any</td>
<td>0</td>
<td>40</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>opener</td>
<td>12</td>
<td>40</td>
<td>0</td>
<td>13</td>
</tr>
<tr>
<td>1major</td>
<td>12</td>
<td>19</td>
<td>4 (Major) Any (Minor)</td>
<td>13</td>
</tr>
</tbody>
</table>
createGraphic

1NT  12  14  2  4
4441 12  40  1  4
strong  19  40  0  8
preempt2  5  10  0  6
preempt3  6  9  0  7
Complex bids  6  9  0  7

South  West  North  East
1NT_LHOdouble  1NT  X
1NT_LHObid  1NT  Any
1NT_RHObid  1NT  Pass  Pass  Any
1major_jacoby2NT  1major  Pass  2NT(Jacoby)

Other parameters are also used, but individually assigned in the function.

Examples

## Not run:

# Collect the ids of 2 hands with any shape
hands <- collectHands(num = 2)
# Collect 6 hands with opening points and a "4441" shape
hands <- collectHands(handType = "4441", num = 6)
# Collect a weak no-trump hand, with a point range of 11 to 15
hands <- collectHands(handType = "weakNT", num = 1, HC_low = 11, HC_high = 15)

## End(Not run)

createGraphic

Description

Create the graphic of the hand

Usage

createGraphic(handNo, handN, handE, handS, handW, dealer, vuln, points)

Arguments

handNo  The id of the hand
handN   The North hand generated by bridgeHand
handE   The East hand generated by bridgeHand
handS   The South hand generated by bridgeHand
find_1major

handW | The West hand generated by bridgeHand
dealer | The hand to become South, the designated dealer
vuln | The hand’s vulnerability
points | The hand’s points

Value

ggplot graphic object

find_1major find_1major

Description

Return a bridge hand that will open 1 of a major

Assumes that a 5 card minor will be bid before 4 card major, except if "canape" set to TRUE, then
a 6 card minor will be opened before a 4 card major

Assumes a weak 1NT, so HC_low is the first point outside the range of 1NT.

Usage

find_1major(HC_low = 15, HC_high = 19, cardLen_min = 4, canape = FALSE)

Arguments

HC_low | The minimum number of high-card points
HC_high | The maximum number of high-card points, otherwise 2-level bid is possible
cardLen_min | The minimum number of cards in the major
canape | Whether a 4 card major will be opened before a 5 card minor

Value

id and seat of compliant hand
**find_1major_jacoby2NT**

---

**Description**

Find hands where South opens one of a major, and North will bid 2NT, to show 4 card support and points for game.

**Usage**

`find_1major_jacoby2NT(HC_low = 13, cardLen_low = 4)`

**Arguments**

- **HC_low** The minimum number of high-card points
- **cardLen_low** The minimum length of a suit

**Value**

id and seat of a compliant hand

---

**find_2preempt**

---

**Description**

Find hands that are likely to preempt at the 2 level in a major.

**Usage**

`find_2preempt(HC_low = 5, HC_high = 10, cardLen_low = 6, cardLen_high = 7)`

**Arguments**

- **HC_low** The minimum number of high-card points
- **HC_high** The maximum number of high-card points
- **cardLen_low** The minimum length of a suit
- **cardLen_high** The maximum length of a suit

**Value**

id and seat of compliant hand
Description

Find hands that are likely to preempt at the 3 level

Usage

```python
find_3preempt(HC_low = 5, HC_high = 10, cardLen_low = 7, cardLen_high = 8)
```

Arguments

- **HC_low**: The minimum number of high-card points
- **HC_high**: The maximum number of high-card points
- **cardLen_low**: The minimum length of a suit
- **cardLen_high**: The maximum length of a suit

Value

FALSE if not compliant, or id and seat of compliant hand

Description

Find hands that comply with a 4441 shape and opening point count

Usage

```python
find_4441(HC_low = 12, HC_high = 35, cardLen_low = 5, cardLen_high = 13)
```

Arguments

- **HC_low**: The minimum number of high-card points
- **HC_high**: The maximum number of high-card points
- **cardLen_low**: The minimum length of a suit
- **cardLen_high**: The maximum length of a suit

Value

id and seat of compliant hand
**find_any**

| find_any | find_any |

**Description**

Return any bridge hand - May not be an opener

**Usage**

find_any()

**Value**

id and seat of compliant hand

**find_opener**

| find_opener | find_opener |

**Description**

Return a bridge hand that is likely to open

**Usage**

find_opener(HC_low = 12)

**Arguments**

| HC_low       | The minimum number of high-card points |

**Value**

id and seat of compliant hand
find_strong

Description
Find hands that are strong enough to open strong

Usage
find_strong(HC_low = 19, HC_high = 35, cardLen_low = 1, cardLen_high = 5)

Arguments
HC_low  The minimum number of high-card points
HC_high The maximum number of high-card points
cardLen_low  The minimum length of a suit
cardLen_high  The maximum length of a suit

Value
id and seat of compliant hand

find_strongNT

Description
Find hands that comply with a weak no trump opening

Usage
find_strongNT(HC_low = 15, HC_high = 17, cardLen_low = 2, cardLen_high = 5)

Arguments
HC_low  The minimum number of high-card points
HC_high The maximum number of high-card points
cardLen_low  The minimum length of a suit
cardLen_high  The maximum length of a suit

Value
id and seat of compliant hand
find\_weak1NT\_LHObid

### Description

Find hands where South will open a weak 1NT and West will likely bid

### Usage

```python
find\_weak1NT\_LHObid(HC\_low = 7, cardLen\_low = 6)
```

### Arguments

- **HC\_low**: The minimum number of high-card points
- **cardLen\_low**: The minimum length of a suit

### Value

id and seat of a compliant hand

---

find\_weak1NT\_LHOx

### Description

Find hands where South will open a weak 1NT and West will likely double

### Usage

```python
find\_weak1NT\_LHOx(HC\_low = 12, HC\_high = 14, cardLen\_low = 2, cardLen\_high = 5, pointsForDouble = 15)
```

### Arguments

- **HC\_low**: The minimum number of high-card points
- **HC\_high**: The maximum number of high-card points
- **cardLen\_low**: The minimum length of a suit
- **cardLen\_high**: The maximum length of a suit
- **pointsForDouble**: Minimum number of points for West to double
find_weakNT

Value
id and seat of a compliant hand

find_weak1NT_RHObid  find_weak1NT_RHObid

Description
Find hands where South will open a weak 1NT, East and North with pass, and West will likely bid

Usage
find_weak1NT_RHObid(HC_low = 7, cardLen_low = 6)

Arguments
HC_low The minimum number of high-card points
cardLen_low The minimum length of a suit

Value
id and seat of a compliant hand
id and seat of a compliant hand

find_weakNT  find_weakNT

Description
Find hands that comply with a no trump opening

Usage
find_weakNT(HC_low = 12, HC_high = 14, cardLen_low = 2, cardLen_high = 4)

Arguments
HC_low The minimum number of high-card points
HC_high The maximum number of high-card points
cardLen_low The minimum length of a suit
cardLen_high The maximum length of a suit

Value
id and seat of compliant hand
**Description**

Produce a page of bridge hands as a PDF. Each page can hold up to 6 hands, and can show all seats or one of the seats can be selected through the `outputSeats` parameter.

- "FULL" or "F" - Show all seats.
- "N" / "E" / "S" / "W" - Show only the specified seats on separate outputs. e.g. "NS" to generate North and South seats.
- "ALL" or "A" - Equivalent to "FNEWS", i.e. Separate pages of each of the four seats, and one page with all seats.

In all cases, only point counts for the selected seats will be visible.

The output PDFs will be saved to a temporary directory, but a directory can be specified in the 'saveOutput' parameter.

**Usage**

```r
ingHands(  
  ids = FALSE,  
  seats = FALSE,  
  handType = "any",  
  num = 12,  
  outputSeats = "F",  
  saveOutputDir = FALSE,  
  ...  
)
```

**Arguments**

- **ids** The ids of hands to be generated
- **seats** The seats of the hands in ids, i.e. the seat which gives the requested conditions, this will become South when printed
- **handType** The type of hand required, default is 'any'. Alternatives include, '4441', 'strong', ...
- **num** The number of hands wanted
- **outputSeats** Character code of required seats, "N", "E", "S", "W" and "F" for the full hand NB "ALL" equivalent to "FNEWS"
- **saveOutputDir** If FALSE (Default) will save to temporary directory, or specify a directory, e.g. "c:/temp/bridger"
- **...** Other variables that may be passed when selecting compliant hands
suitSplit

Value

Text message, confirming completion and specifying location of PDF outputs

Examples

```r
## Not run:
# Produce a hand showing all seats and save them to 'c:/temp/bridger' directory
printHands(handType = "any", num = 1, outputSeats = "FULL", saveOutput = FALSE)
# Produce a page of 6 hands likely to open with a 3-level preempt, only showing the South seat
printHands(handType = "preempt3", num = 6, outputSeats = "S")
# Produce the specified hands, showing all seats
printHands(ids = c(500, 501, 502), seats = c("E", "W", "S"), outputSeats = "FULL")
## End(Not run)
```

suitSplit

Description

Provides the probabilities with with a number of cards will split between two hands, given a number of unknown cards in each hand. Unknown hands are assumed to be West and East.

If there is no information to indicate different numbers of unknown cards in both hands, then symmetrical probabilities will be returned. However, if one hand is expected to have a different number of cards to the other, then these can be specified. For example, if during the bidding East overcalled in spades, indicating a 5 card suit, then when looking at hearts, East has fewer cards. While the number of assumed cards in West’s hand is 13 (‘cards_W = 13’), the assumed cards in East should be reduced to 8 (‘cards_E = 8’)

Usage

```r
suitSplit(missingCards = 5, cards_W = 13, cards_E = 13)
```

Arguments

- `missingCards` The number of cards held by the two hands
- `cards_W` Cards in West hands
- `cards_E` Cards in East hands

Value

Tibble of probabilities

Examples

```r
suitSplit(missingCards = 6, cards_W = 13, cards_E = 8)
```
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