Package 'maraca'

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Type Package

Title The Maraca Plot: Visualization of Hierarchical Composite Endpoints in Clinical Trials

License Apache License (>= 2)

Description Library that supports visual interpretation of hierarchical composite endpoints (HCEs). HCEs are complex constructs used as primary endpoints in clinical trials, combining outcomes of different types into ordinal endpoints, in which each patient contributes the most clinically important event (one and only one) to the analysis.

URL https://github.com/AstraZeneca/maraca

BugReports https://github.com/AstraZeneca/maraca/issues

Encoding UTF-8

LazyData true

Depends R (>= 3.5), ggfortify (>= 0.4)

Imports dplyr (>= 1.0), tidyr (>= 1.2), ggplot2 (>= 3.3), gridExtra (>= 2.3), survival (>= 3.3), hce (>= 0.0.2), checkmate (>= 2.1)

RoxygenNote 7.2.1

Suggests knitr (>= 1.39), here (>= 1.0.1), lintr (>= 3.0.0), withr (>= 2.5.0), testthat (>= 3.1), rmarkdown

NeedsCompilation no

VignetteBuilder knitr

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`hce_scenario_a` *Example HCE scenario A.*

Description

This is example data frame containing the example for scenario A.

Usage

```
data(hce_scenario_a)
```

Format

A data frame with 1000 rows.

X Row number

SUBJID The patient identifier

GROUP Which type of outcome the row belongs to

GROUPN Not required for computation. The group as an arbitrary numerical value

AVAL0 Contains both the time-to-event data for hard outcomes and the continuous data for the continuous outcome

AVAL Not required for computation. Create an ordered sequence of values where the AVAL0 value associated with the patient is offset by GROUPN

TRTP Treatment group

hce_scenario_b *Example HCE scenario B.*

Description

This is example data frame containing the example for scenario B.

Usage

```
data(hce_scenario_b)
```

Format

A data frame with 1000 rows.

X Row number

SUBJID The patient identifier

GROUP Which type of outcome the row belongs to

GROUPN Not required for computation. The group as an arbitrary numerical value

AVAL0 Contains both the time-to-event data for hard outcomes and the continuous data for the continuous outcome

AVAL Not required for computation. Create an ordered sequence of values where the AVAL0 value associated with the patient is offset by GROUPN

TRTP Treatment group

hce_scenario_c *Example HCE scenario C.*

Description

This is example data frame containing the example for scenario C.

Usage

```
data(hce_scenario_c)
```

Format

A data frame with 1000 rows.

X Row number

SUBJID The patient identifier

GROUP Which type of outcome the row belongs to

GROUPN Not required for computation. The group as an arbitrary numerical value

AVAL0 Contains both the time-to-event data for hard outcomes and the continuous data for the continuous outcome

AVAL Not required for computation. Create an ordered sequence of values where the AVAL0 value associated with the patient is offset by GROUPN

TRTP Treatment group

`hce_scenario_d` *Example HCE scenario D.*

Description

This is example data frame containing the example for scenario D.

Usage

```
data(hce_scenario_d)
```

Format

A data frame with 1000 rows.

X Row number

SUBJID The patient identifier

GROUP Which type of outcome the row belongs to

GROUPN Not required for computation. The group as an arbitrary numerical value

AVAL0 Contains both the time-to-event data for hard outcomes and the continuous data for the continuous outcome

AVAL Not required for computation. Create an ordered sequence of values where the AVAL0 value associated with the patient is offset by GROUPN

TRTP Treatment group

hce_scenario_kccq3 *Example HCE scenario KCCQ3.*

Description

This is example data frame containing the example for scenario KCCQ3.

Usage

```
data(hce_scenario_kccq3)
```

Format

A data frame with 5000 rows.

SUBJID The patient identifier

GROUP Which type of outcome the row belongs to

GROUPN Not required for computation. The group as an arbitrary numerical value

AVAL0 Contains both the time-to-event data for hard outcomes and the continuous data for the continuous outcome

AVAL Not required for computation. Create an ordered sequence of values where the AVAL0 value associated with the patient is offset by GROUPN

TRTP Treatment group

HFHT Not needed

SEED Not needed

maraca *maraca package.*

Description

Creates the maraca analysis object as an S3 object of class 'maraca'.

Usage

```
maraca(
  data,
  tte_outcomes,
  continuous_outcome,
  arm_levels = c(active = "active", control = "control"),
  column_names = c(outcome = "outcome", arm = "arm", value = "value"),
  fixed_followup_days = NULL,
  compute_win_odds = FALSE
)
```

Arguments

data	A data frame with columns for the following information: - outcome column, containing the time-to-event and continuous labels - arm column, contaning the arm a given row belongs to. - value column, containing the values.
tte_outcomes	A vector of strings containing the time-to-event outcome labels. The order is kept for the plot.
continuous_outcome	A single string containing the continuous outcome label.
arm_levels	A named vector of exactly two strings, mapping the values used for the active and control arms to the values used in the data. The names must be "active" and "control" in this order. Note that this parameter only need to be specified if you have labels different from "active" and "control".
column_names	A named vector to map the outcome, arm, value to the associated column names in the data. The vector names must match in order "outcome", "arm", and "value". Note that this parameter only need to be specified if you have column names different from the ones above.
fixed_followup_days	The followup days, or NULL. If NULL, use the largest value across the hard outcomes.
compute_win_odds	If TRUE compute the win odds, otherwise (default) don't compute them.

Value

An object of class 'maraca'. The object information must be considered private.

Examples

```
data(hce_scenario_a)
hce_test <- maraca(
  data = hce_scenario_a,
  tte_outcomes = c("Outcome I", "Outcome II", "Outcome III", "Outcome IV"),
  continuous_outcome = "Continuous outcome",
  column_names = c(outcome = "GROUP", arm = "TRTP", value = "AVAL0"),
  arm_levels = c(active = "Active", control = "Control"),
  compute_win_odds = TRUE
)
```

---

plot.hce *Generic function to plot the hce object using plot().*

Description

This will produce the plot_maraca plot.

Usage

```
## S3 method for class 'hce'
plot(
  x,
  continuous_grid_spacing_x = 10,
  trans = "identity",
  density_plot_type = "default",
  vline_type = "median",
  compute_win_odds = FALSE,
  ...
)
```

Arguments

x	an object of S3 class 'hce'
continuous_grid_spacing_x	The spacing of the x grid to use for the continuous section of the plot.
trans	the transformation to apply to the data before plotting. The accepted values are the same that ggplot2::scale_x_continuous
density_plot_type	The type of plot to use to represent the density. Accepts "default", "violin", "box" and "scatter".
vline_type	what the vertical dashed line should represent. Accepts "median", "mean", "none".
compute_win_odds	If TRUE compute the win odds, otherwise (default) don't compute them.
...	not used

Value

Used for side effect. Plots the maraca object.

Examples

```
set.seed(31337)
Rates_A <- c(1.72, 1.74, 0.58, 1.5, 1)
Rates_P <- c(2.47, 2.24, 2.9, 4, 6)
HCE <- hce::simHCE(n = 2500, TTE_A = Rates_A, TTE_P = Rates_P,
             CM_A = -3, CM_P = -6, CSD_A = 16, CSD_P = 15, fixedfy = 3)
plot(HCE)
```

plot.maraca *Generic function to plot the maraca object using plot().*

Description

This will produce the plot_maraca plot.

Usage

```
## S3 method for class 'maraca'
plot(
  x,
  continuous_grid_spacing_x = 10,
  trans = "identity",
  density_plot_type = "default",
  vline_type = "median",
  ...
)
```

Arguments

x	an object of S3 class 'maraca'
continuous_grid_spacing_x	The spacing of the x grid to use for the continuous section of the plot.
trans	the transformation to apply to the data before plotting. The accepted values are the same that ggplot2::scale_x_continuous
density_plot_type	The type of plot to use to represent the density. Accepts "default", "violin", "box" and "scatter".
vline_type	what the vertical dashed line should represent. Accepts "median", "mean", "none".
...	not used

Value

Used for side effect. Plots the maraca object.

Examples

```
data(hce_scenario_a)
hce_test <- maraca(
  data = hce_scenario_a,
  tte_outcomes = c("Outcome I", "Outcome II", "Outcome III", "Outcome IV"),
  continuous_outcome = "Continuous outcome",
  column_names = c(outcome = "GROUP", arm = "TRTP", value = "AVAL0"),
  arm_levels = c(active = "Active", control = "Control"),
  compute_win_odds = TRUE
```

```
)
plot(hce_test)
```

---

plot_maraca *Creates and returns the plot of the maraca data.*

Description

Creates and returns the plot of the maraca data.

Usage

```
plot_maraca(
  obj,
  continuous_grid_spacing_x = 10,
  trans = "identity",
  density_plot_type = "default",
  vline_type = "median"
)
```

Arguments

obj	an object of S3 class 'maraca'
continuous_grid_spacing_x	The spacing of the x grid to use for the continuous section of the plot.
trans	the transformation to apply to the data before plotting. The accepted values are the same that ggplot2::scale_x_continuous
density_plot_type	which type of plot to display in the continuous part of the plot. Options are "default", "violin", "box", "scatter".
vline_type	what the vertical lines in the continuous part of the plot should highlight. Options are "median", "mean", "none".

Value

a ggplot2 object of the data. This function will not render the plot immediately. You have to print() the returned object for it to be displayed.

Examples

```
data(hce_scenario_a)
hce_test <- maraca(
  data = hce_scenario_a,
  tte_outcomes = c("Outcome I", "Outcome II", "Outcome III", "Outcome IV"),
  continuous_outcome = "Continuous outcome",
  column_names = c(outcome = "GROUP", arm = "TRTP", value = "AVAL0"),
```

```
  arm_levels = c(active = "Active", control = "Control"),
  compute_win_odds = TRUE
)
plot <- plot_maraca(hce_test)
```

`plot_tte_components` *Creates and returns the tte components plot of the maraca data.*

Description

Creates and returns the tte components plot of the maraca data.

Usage

```
plot_tte_components(obj)
```

Arguments

`obj`	an object of S3 class 'maraca'

Value

An object representing the plot of the data. This function will not render the plot immediately. You have to print() the returned object for it to be displayed.

Examples

```
data(hce_scenario_a)
hce_test <- maraca(
  data = hce_scenario_a,
  tte_outcomes = c("Outcome I", "Outcome II", "Outcome III", "Outcome IV"),
  continuous_outcome = "Continuous outcome",
  column_names = c(outcome = "GROUP", arm = "TRTP", value = "AVAL0"),
  arm_levels = c(active = "Active", control = "Control"),
  compute_win_odds = TRUE
)
plot <- plot_tte_components(hce_test)
```

`plot_tte_composite` *Creates and returns the tte composite plot of the maraca data.*

Description

Creates and returns the tte composite plot of the maraca data.

Usage

```
plot_tte_composite(obj)
```

Arguments

`obj`	an object of S3 class 'maraca'

Value

a ggplot2 object of the data. This function will not render the plot immediately. You have to print() the returned object for it to be displayed.

Examples

```
data(hce_scenario_a)
hce_test <- maraca(
  data = hce_scenario_a,
  tte_outcomes = c("Outcome I", "Outcome II", "Outcome III", "Outcome IV"),
  continuous_outcome = "Continuous outcome",
  column_names = c(outcome = "GROUP", arm = "TRTP", value = "AVAL0"),
  arm_levels = c(active = "Active", control = "Control"),
  compute_win_odds = TRUE
)
plot <- plot_tte_composite(hce_test)
```

`print.maraca_tte_components` *Generic to print the maraca_tte_component that is not a ggplot.*

Description

Generic to print the maraca_tte_component that is not a ggplot.

Usage

```
## S3 method for class 'maraca_tte_components'
print(x, ...)
```

Arguments

x	an object of S3 class 'maraca_tte_components'
...	not used

Value

Used for side effect. Plots the maraca_tte_components object.

Examples

```
data(hce_scenario_a)
hce_test <- maraca(
  data = hce_scenario_a,
  tte_outcomes = c("Outcome I", "Outcome II", "Outcome III", "Outcome IV"),
  continuous_outcome = "Continuous outcome",
  column_names = c(outcome = "GROUP", arm = "TRTP", value = "AVAL0"),
  arm_levels = c(active = "Active", control = "Control"),
  compute_win_odds = TRUE
)
plot <- plot_tte_components(hce_test)
print(plot)
```

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