Package: DoExp (via r-universe)

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Type Package

Title Design of Experiments with Hasse Diagrams and Anatomy Tables

Version 0.1.0

Depends R (>= 4.1.0)

Description Constructs Hasse diagrams and anatomy tables from structural formulas and experimental data sets. Hasse diagrams may display sources of variation and their degrees of freedom for general experimental structures. For orthogonal designs, the package can also compute core matrices associated with quadratic forms for sums of squares and contributions to the expected mean squares. Anatomy tables display the degrees of freedom and A-efficiencies associated with the sources of variation.

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Encoding UTF-8

RoxygenNote 7.3.3

Imports dplyr, ggplot2, knitr, psych, purrr, rlang, stringr, tibble, utils

Suggests dae, patchwork, rmarkdown

NeedsCompilation no

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`atable` *atable*

Description

Returns the Anatomy Table with degrees of freedom and the a-effiency for each source of variation for the ANOVA model, from the structural formulas of units and tratments and a data.frame.

Usage

```
atable(units = NULL, trt = NULL, data = NULL)
```

Arguments

`units`	a structural formula of units as a character.
`trt`	a structural formula of treatments as a character.
`data`	data.frame containing the variables named in the structural formulas.

Value

an object of class `knitr_kable` containing an formatted representation of the input table.

Examples

```
if (requireNamespace("dae", quietly = TRUE)) {
  blocks <- dae::fac.gen(list(
    Blocks = 4,
    A = 2,
    C = 3
  ))

  blocks$Plots <- rep(1:6, times = 4)

  anatomytableCBD <- atable(
    units = "Blocks/Plots",
    trt = "A*C",
    data = blocks
  )

  BIBD <- data.frame(
    Blocks = factor(gl(10, 3)),
```

```
    Plots = factor(rep(1:3, times = 10)),
    Treat = factor(c(
      1, 2, 3, 1, 2, 4, 1, 2, 5, 1,
      3, 4, 1, 3, 5, 1, 4, 5, 2, 3,
      4, 2, 3, 5, 2, 4, 5, 3, 4, 5
    ))
  )

  anatomytableBIBD <- atable(
    units = "Blocks/Plots",
    trt = "Treat",
    data = BIBD
  )
}
```

`Hassediagramdf` *Hassediagramdf*

Description

Returns the Hasse diagram with: source of variation, degrees of freedom, matrices of the quadratic forms for sums of squares and the contributions to the expectations of mean squares,from structural formulas.

Usage

```
Hassediagramdf(
  sform = NULL,
  data = NULL,
  rightcolor = "red",
  titlehd = "Hasse diagram",
  subtitlehd = "Levels & Degrees of freedom"
)
```

Arguments

`sform`	a structural formula as a character.
`data`	data.frame containing the variables named in structural the formulas.
`rightcolor`	the color of everything to the right of the dot in the Hasse diagram. Default is "red".
`titlehd`	The graph title. Can be NULL. Default: "Hasse diagram".
`subtitlehd`	The graph subtitle. Can be NULL. Default: "Levels & Degrees of freedom".

Value

an object of class `ggplot` with Hasse diagrams for deegrees of freedom.

Examples

```
if (requireNamespace("dae", quietly = TRUE)) {
  blocks <- dae::fac.gen(list(
    Blocks = 4,
    A = 2,
    C = 3
  ))

  blocks$Plots <- rep(1:6, times = 4)

  unitsdf <- Hassediagramdf(
    sform = "Blocks/Plots",
    data = blocks,
    rightcolor = "red",
    titlehd = "Hasse diagram",
    subtitlehd = "Levels & Degrees of freedom"
  )

  trtdf <- Hassediagramdf(
    sform = "A*C",
    data = blocks,
    rightcolor = "blue",
    titlehd = "Hasse diagram",
    subtitlehd = "Levels & Degrees of freedom"
  )

  unitsdf
  trtdf
}
```

---

objectHasse *objectHasse*

Description

Returns the Hasse diagram with: source of variation, degrees of freedom, matrices of the quadratic forms for sums of squares and the contributions to the expectations of mean squares,from structural formulas.

Usage

```
objectHasse(
  sform = NULL,
  data = NULL,
  type = NULL,
  random = NULL,
  advancedrandom = NULL
)
```

Arguments

`sform`	a structural formula as a character.
`data`	data.frame containing the variables named in structural the formulas.
`type`	indicates whether the factors are unit factors or treatment factors. For unit factors: "unit", "units", "unrandomized", or "recipient". For treatment factors: "treatment", "trt", "randomized", or "allocated".
`random`	a vector containing the variables related to the random factors. All factors for which the stated factors are marginal will be assumed to be random.
`advancedrandom`	a vector containing the variables related to the random. factors. Here the factor for which the stated factors are marginal will not be assumed to be random.

Value

An object of class `object_hasse` containing a structured list with the information required to construct Hasse diagrams using `plotHasse()`

Examples

```
if (requireNamespace("dae", quietly = TRUE)) {
  blocks <- dae::fac.gen(list(
    Blocks = 4,
    A = 2,
    C = 3
  ))

  blocks$Plots <- rep(1:6, times = 4)

  units <- objectHasse(
    sform = "Blocks/Plots",
    data = blocks,
    type = "units",
    random = NULL,
    advancedrandom = NULL
  )

  treatments <- objectHasse(
    sform = "A*C",
    data = blocks,
    type = "trt",
    random = c("A"),
    advancedrandom = NULL
  )
}
```

plotHasse *plotHasse*

Description

Returns the Hasse diagram with: source of variation, degrees of freedom, matrices of the quadratic forms for sums of squares and the contributions to the expectations of mean squares,from structural formulas.

Usage

```
plotHasse(
  diagram = NULL,
  which = NULL,
  titlehd = "Hasse diagram",
  subtitlehd = "",
  leftcolor = "blue",
  rightcolor = "red"
)
```

Arguments

diagram	an object from objectHasse with informations for ploting.
which	a character to select which graph will be generated. Choose between: "sv", "df", "M", and "EMS".
titlehd	The graph title. Can be NULL. Default: "Hasse diagram".
subtitlehd	The graph subtitle. Can be NULL. Default: NULL.
leftcolor	the color of everything to the left of the dot in the Hasse diagram. Default is "blue".
rightcolor	the color of everything to the right of the dot in the Hasse diagram. Default is "red".

Value

An object of class `ggplot` containing Hasse diagrams based on sources of variation, degrees of freedom, core matrices of quadratic forms, or expected mean squares.

Examples

```
if (requireNamespace("dae", quietly = TRUE)) {
  blocks <- dae::fac.gen(list(
    Blocks = 4,
    A = 2,
    C = 3
  ))
```

```
  blocks$Plots <- rep(1:6, times = 4)

  units <- objectHasse(
    sform = "Blocks/Plots",
    data = blocks,
    type = "units",
    random = NULL,
    advancedrandom = NULL
  )

  treatments <- objectHasse(
    sform = "A*C",
    data = blocks,
    type = "trt",
    random = c("A"),
    advancedrandom = NULL
  )

  svunits <- plotHasse(diagram = units, which = "sv")
  svtrt   <- plotHasse(diagram = treatments, which = "sv")

svunits
svtrt
}
```

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