Package 'LatSquare'

June 23, 2026

Title Analysis of Latin Square and Semi-Latin Square Designs

Version 0.4.1

Description Provides functions for the analysis of Latin Square and Semi-Latin Square (Latin Rectangle) experimental designs, including analysis of variance (ANOVA), least significant difference (LSD) tests, and calculation of summary statistics. The implemented methods follow Munzert (1992, ISBN: 3-489-53410-7).

Depends R (>= 4.0.0)

Imports openxlsx

License GPL-3

Encoding UTF-8

RoxygenNote 8.0.0

NeedsCompilation no

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Repository CRAN

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Contents

LQuad *Wrapper for Excel input*

Description

Reads an Excel file and calls LQuad_df.

Usage

```
LQuad(
  file_path,
  sheet_name,
  block_col,
  column_col,
  treatment_col,
  response_cols
)
```

Arguments

file_path	Path to Excel file
sheet_name	Sheet name
block_col	Column name for block factor
column_col	Column name for column factor
treatment_col	Column name for treatment factor
response_cols	Vector of response variable column names

Value

A named list identical to the output of `LQuad_df()`, i.e. ANOVA results, LSD values and means for each response variable.

Examples

```
file <- system.file("extdata", "munzert_example_tab4_9.xlsx",
                    package = "LatSquare")

res <- LQuad(
  file_path = file,
  sheet_name = "Kartoffeln",
  block_col = "Block",
  column_col = "Saeule",
  treatment_col = "VNr",
  response_cols = "ParzErtrag_in_kg"
)

res
```

LQuad_df *Analysis of a Latin Square / Semi Latin Square*

Description

Performs ANOVA for a Latin square or semi-Latin square (Latin rectangle) design and calculates LSD values and treatment means. The implemented methods follow Munzert (1992, ISBN: 3-489-53410-7).

Usage

```
LQuad_df(data, block_col, column_col, treatment_col, response_cols)
```

Arguments

data	Data frame containing the experimental data
block_col	Column name for block factor
column_col	Column name for column factor
treatment_col	Column name for treatment factor
response_cols	Vector of response variable column names

Value

A named list with one element per response variable. Each element contains:

Design List with design parameters: number of blocks, columns, treatments, factor a, number of observations, and type of design (Latin square or Latin rectangle).

ANOVA Data frame with analysis of variance including degrees of freedom (DF), sum of squares (SS), mean squares (MS), F-values and p-values.

LSD Data frame containing least significant difference values for significance levels 0.05 and 0.01.

Means List of means including overall mean as well as means for blocks, columns, and treatments.

Examples

```
file <- system.file("extdata", "munzert_example_tab4_9.xlsx",
                    package = "LatSquare")

dat <- openxlsx::read.xlsx(file, sheet = "Kartoffeln")

res <- LQuad_df(
  data = dat,
  block_col = "Block",
  column_col = "Saeule",
  treatment_col = "VNr",
  response_cols = "ParzErtrag_in_kg"
)

res
```

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