

# Package: LatSquare (via r-universe)

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** <https://cran.r-universe.dev>

**Date/Publication** 2026-06-23 15:28:21 UTC

**RemoteUrl** <https://github.com/cran/LatSquare>

**RemoteRef** HEAD

**RemoteSha** 131705a414a059480cd8c6ce5e499280c094518c

## Contents

LQuad . . . . .	2
LQuad_df . . . . .	3
<b>Index</b>	<b>4</b>

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LQuad

*Wrapper for Excel input*

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### 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
```

**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
```

# Index

LQuad, [2](#)

LQuad\_df, [3](#)