Package 'PRBMSdesigns'

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Title Partially Residual Balanced Multi-Session Designs

Version 1.0.1

Description Provides functions for generating novel partially residual balanced multi-session designs. These designs arrange products over sessions and periods under partial balance restrictions and compute canonical efficiency factors for direct and residual (carryover) effects. For general background on PRBMS and related crossover design literature, see Aggarwal and Jha (2006) <doi:10.1080/03610920600695824> and Fardos et al. (2023) <doi:10.18576/jsap/120227>.

License GPL-2

Encoding UTF-8

Imports MASS

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NeedsCompilation no

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Contents

SERIES1 *Series 1 PRBMS Design*

Description

This function generates a new series of PRBMS designs using initial sequence q1: [1, v, 2, v-1, ..., v/2, v/2+1] with parameters (v, s = v/2, m = 2, p = v), and calculates the canonical efficiency factors.

Usage

```
SERIES1(v, verbose = TRUE)
```

Arguments

v	Total number of products
verbose	Logical; if TRUE, prints design layout and efficiency factors

Value

A list containing design and efficiency measures

Examples

```
SERIES1(8, verbose = FALSE)
```

SERIES2 *Series 2 PRBMS Design*

Description

This function generates a new series of PRBMS designs using initial sequence q1: [1, v, 2, v-1, ..., v/2, v/2+1] with parameters (v, s = 2, m = v/2, p = v), and calculates the canonical efficiency factors.

Usage

```
SERIES2(v, verbose = TRUE)
```

Arguments

v	Total number of products
verbose	Logical; if TRUE, prints design layout and efficiency factors

Value

A list containing design and efficiency measures

Examples

```
SERIES2(8, verbose = FALSE)
```

SERIES3 *Series 3 PRBMS Design*

Description

This function generates a new series of PRBMS designs using initial sequence q1: [1, v, 2, v-1, ..., v/2, v/2+1] with parameters (v, s = 2, m = (v - 2)/2, p = v), and calculates the canonical efficiency factors.

Usage

```
SERIES3(v, verbose = TRUE)
```

Arguments

v	Total number of products
verbose	Logical; if TRUE, prints design layout and efficiency factors

Value

A list containing design and efficiency measures

Examples

```
SERIES3(8, verbose = FALSE)
```

SERIES4 *Series 4 PRBMS Design*

Description

This function generates a new series of PRBMS designs using initial sequences q2: [1, v, 2, v-1, ..., (v+3)/2, (v+1)/2] or q3: [v, 1, v-1, 2, ..., (v-1)/2, (v+1)/2], with parameters (v, s = 2, m = (v - 1)/2, p = v), and calculates the canonical efficiency factors.

Usage

```
SERIES4(v, verbose = TRUE)
```

Arguments

v	Total number of products
verbose	Logical; if TRUE, prints design layout and efficiency factors

Value

A list containing design and efficiency measures

Examples

```
SERIES4(7, verbose = FALSE)
```

SERIES5 *Series 5 PRBMS Design*

Description

This function generates a new series of PRBMS designs using initial sequences q2: [1, v, 2, v-1, ..., (v+3)/2, (v+1)/2] or q3: [v, 1, v-1, 2, ..., (v-1)/2, (v+1)/2], with parameters (v, s = 2, m = [(v - 1)/2, (v + 1)/2], p = v), and calculates the canonical efficiency factors.

Usage

```
SERIES5(v, verbose = TRUE)
```

Arguments

v	Total number of products
verbose	Logical; if TRUE, prints design layout and efficiency factors

Value

A list containing design and efficiency measures

Examples

```
SERIES5(7, verbose = FALSE)
```

SERIES6 *Series 6 PRBMS Design*

Description

This function generates a new series of PRBMS designs using initial sequence q4: [x^0, x^1, x^2, ..., x^(v - 2)] with parameters (v, s = 2, m = (v - 1)/2, p = v), and calculates the canonical efficiency factors.

Usage

```
SERIES6(v, verbose = TRUE)
```

Arguments

v	Total number of products
verbose	Logical; if TRUE, prints design layout and efficiency factors

Value

A list containing design and efficiency measures

Examples

```
SERIES6(7, verbose = FALSE)
```

SERIES7 *Series 7 PRBMSD Designs*

Description

This function generates a new series of PRBMS designs using the initial sequence q4': [x^0, x^1, x^2, ..., x^(v-2)] with parameters (v, s = 2, m = [(v - 1)/2, (v + 1)/2], p = v). It also computes the canonical efficiency factors

Usage

```
SERIES7(v, verbose = TRUE)
```

Arguments

v	Total number of products (must be prime)
verbose	Logical; if TRUE, prints design layout and efficiency factors

Value

A list containing design and efficiency measures

Examples

```
SERIES7(7, verbose = FALSE)
```

Index