Package ‘RPPairwiseDesign’

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Title Resolvable partially pairwise balanced design and Space-filling design via association scheme
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Author Mohamed Laib, Imane Rezgui and Zebida Gheribi-Aoulmi
Maintainer Mohamed Laib <laibmed@gmail.com>
Description Using some association schemes to obtain a new series of resolvable partially pairwise balanced designs (RPPBD) and space-filling designs.
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Resolvable Partially Pairwise Balanced Design and Space-filling Design via Association Scheme.

Description

In this package, we apply the (ASC-RPPBD) method on a series of association schemes to construct their associated RPPBD. Moreover, we apply the algorithm (ASC-SF) on the same series of association schemes to obtain their associated space filling design. Each design is identified by its configuration and its parameters.

Details

Package: RPPairwiseDesign
Type: Package
Version: 1.0
Date: 2014-12-10
License: GPL-3

Note

The Association schemes used in this R-package are:
- Rectangular association scheme.
- Group divisible association scheme.
- Nested group divisible association scheme.
- Right angular association scheme
- Generalized rectangular right angular association scheme(4)
- Generalized rectangular right angular association scheme(5)
- Generalized rectangular right angular association scheme(7)

Author(s)

Mohamed Laib, Imane Rezgui and Zebida Gheribi-Aoulmi
Maintainer: Mohamed Laib <laib.med@gmail.com>

References


Imane Rezgui M.LAIB and Z.Gheribi-Aoulmi NEW SERIES OF RESOLVABLE PARTIALLY PAIRWISE BALANCED DESIGNS AND THEIR ASSOCIATED SPACE FILLING DESIGNS accepted Proceeding on Afrika Statistika.


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**PPdiv**

*Group divisible RPPBD*

**Description**

The configuration of group divisible RPPBD obtained by applying the (ASC-RPPBD) method on a group divisible association scheme.

**Usage**

`PPdiv(n, l)`

**Arguments**

- `n` Number of lines of the association schemes.
- `l` Number of columns of the association schemes.

**Value**

A LIST:

- `rppbd` The configuration of the RPPBD
- `v` Number of treatments
- `b` Number of blocs
- `r` The repetition of each treatments
- `k` A vector of the different bloc’s size
- `lampa` A vector of the different values of lamda(i) (i=1,...,m)

**Author(s)**

Mohamed Laib, Imane Rezgui and Zoubida Gheribi-Aoulmi
PPGectRightAng4

References

Imane Rezgui M.LAIB and Z.Gheribi-Aoulmi NEW SERIES OF RESOLVABLE PARTIALLY PAIRWISE BALANCED DESIGNS AND THEIR ASSOCIATED SPACE FILLING DESIGNS; accepted Proceeding on Afrika Statistika.


Examples

n<-3
l<-3
PPdiv(n,l)

PPGectRightAng4 Generalized rectangular right angular RPPBD (4).

Description

The configuration of Generalized rectangular right angular RPPBD (4) obtained by applying the (ASC-RPPBD) method on a Generalized rectangular right angular association scheme (4).

Usage

PPGectRightAng4(n, l, w)

Arguments

n Number of lines of the association schemes array
l Number of columns of the association schemes array
w Number of the association scheme arrays

Value

A LIST:

RPPBD The configuration of the RPPBD
v Number of treatments
b Number of blocs
r The repetition of each treatments
k A vector of the different bloc’s size
lamda A vector of the different values of lamda(i) (i=1,...,m)
Author(s)
Mohamed Laib, Imane Rezgui and Zoubida Gheribi-Aoulmi

References
Imane Rezgui M.LAIB and Z.Gheribi-Aoulmi NEW SERIES OF RESOLVABLE PARTIALLY
PAIRWISE BALANCED DESIGNS AND THEIR ASSOCIATED SPACE FILLING DESIGNS;
accepted Proceeding on Afrika Statistika.
Imane Rezgui and Z.Gheribi-Aoulmi New Series of Resolvable Partially Pairwise Balanced and
Space Filling Designs via Association Schemes submitted.
Balanced Incomplete Block Designs with \( m = 4, 5 \) and \( 7 \) Associated Classes. Applied Mathematics.
to be appear.

Examples
```r
n<-3
l<-3
w<-3
PPGrectRightAng5(n, l, w)
```

Description
The configuration of Generalized rectangular right angular RPPBD (5) obtained by applying the
(ASC-RPPBD) method on a Generalized rectangular right angular association scheme (5).

Usage
```r
PPGrectRightAng5(n, l, w)
```

Arguments
- `n`: Number of lines of the association schemes array
- `l`: Number of columns of the association schemes array
- `w`: Number of the association scheme arrays
Value

A LIST :

  RPPBD    The configuration of the RPPBD
  v        Number of treatments
  b        Number of blocs
  r        The repetition of each treatments
  k        A vector of the different bloc’s size
  lamda    A vector of the different values of lamda(i) (i=1,...,m)

Author(s)

Mohamed Laib, Imane Rezgui and Zoubida Gheribi-Aoulmi

References

Imane Rezgui M.LAIB and Z.Gheribi-Aoulmi NEW SERIES OF RESOLVABLE PARTIALLY PAIRWISE BALANCED DESIGNS AND THEIR ASSOCIATED SPACE FILLING DESIGNS; accepted Proceeding on Afrika Statistika.


Examples

n<-3
#The number of columns of the association scheme array need be bigger than 2
l<-3
w<-3
PPGrectRightAng5(n, l, w)

PPGrectRightAng7  Generalized rectangular right angular RPPBD (7).

Description

The configuration of Generalized rectangular right angular RPPBD (7) obtained by applying the (ASC-RPPBD) method on a Generalized rectangular right angular association scheme (7).

Usage

PPGrectRightAng7(n, l, w)
Arguments

- **n**: Number of lines of the association schemes array
- **l**: Number of columns of the association schemes array
- **w**: Number of the association scheme arrays

Value

- A LIST:
  - **RPPBD**: The configuration of the RPPBD
  - **v**: Number of treatments
  - **b**: Number of blocs
  - **r**: The repetition of each treatments
  - **k**: A vector of the different bloc’s size
  - **lamda**: A vector of the different values of lamda(i) (i=1,...,m)

Author(s)

Mohamed Laib, Imane Rezgui and Zoubida Gheribi-Aoulmi

References

Imane Rezgui M.LAIB and Z.Gheribi-Aoulmi NEW SERIES OF RESOLVABLEPARTIALLY PAIRWISE BALANCED DESIGNS AND THEIR ASSOCIATED SPACE FILLING DESIGNS; accepted Proceeding on Afrika Statistika.


Examples

```r
n<-3
#The number of columns of the association scheme array need be bigger than 2
l<-3
w<-3
PPGrectRightAng7(n, l, w)
```
**Description**

The configuration of Nested group divisible RPPBD obtained by applying the (ASC-RPPBD) method on a nested group divisible association scheme.

**Usage**

```latex
PPNestdiv(n, l, w)
```

**Arguments**

- **n**: Number of lines of the association schemes array
- **l**: Number of columns of the association schemes array
- **w**: Number of the association scheme arrays

**Value**

A LIST:

- `RPPBD`: The configuration of the RPPBD
- `v`: Number of treatments
- `b`: Number of blocs
- `r`: The repetition of each treatments
- `k`: A vector of the different bloc’s size
- `Lambda`: A vector of the different values of lamba(i) (i=1,...,m)

**Author(s)**

Mohamed Laib, Imane Rezgui and Zoubida Gheribi-Aoulmi

**References**

Imane Rezgui M.LAIB and Z.Gheribi-Aoulmi NEW SERIES OF RESOLVABLE PARTIALLY PAIRWISE BALANCED DESIGNS AND THEIR ASSOCIATED SPACE FILLING DESIGNS; accepted Proceeding on Afrika Statistika.


Examples
n<-3
l<-3
w<-3
PPNestdiv(n, l, w)

PPrect

Rectangular RPPBD.

Description
The configuration of rectangular RPPBD obtained by applying the (ASC-RPPBD) method on a rectangular association scheme.

Usage
PPrect(n, l)

Arguments
n Number of lines of the association schemes array
l Number of columns of the association schemes array

Value
A LIST:
    RPPBD The configuration of the RPPBD
    v Number of treatments
    b Number of blocs
    r The repetition of each treatments
    k A vector of the different bloc’s size
    lambda A vector of the different values of lamda(i) (i=1,...,m)

Author(s)
Mohamed Laib, Imane Rezgui and Zoubida Gheribi-Aoulmi

References
Imane Rezgui M.LAIB and Z.Gheribi-Aoulmi NEW SERIES OF RESOLVABLE PARTIALLY PAIRWISE BALANCED DESIGNS AND THEIR ASSOCIATED SPACE FILLING DESIGNS; accepted Proceeding on Afrika Statistika.
Examples

```r
n<-3
l<-3
pprect(n, l)
```

---

**PPrightAng**

*Right angular RPPBD*

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**Description**

The configuration of right angular RPPBD obtained by applying the (ASC-RPPBD) method on a right angular association scheme.

**Usage**

```r
PPrightAng(n, l, w)
```

**Arguments**

- `n`: Number of lines of association schemes array.
- `l`: Number of columns of association schemes array.
- `w`: Number of the association scheme arrays.

**Value**

A LIST:

- `rppbd`: The configuration of the RPPBD
- `v`: Number of treatments
- `b`: Number of blocs
- `r`: The repetition of each treatments
- `k`: A vector of the different bloc's size
- `lamda`: A vector of the different values of lamda(i) (i=1,...,n)

**Author(s)**

Mohamed Laib, Imane Rezgui and Zoubida Gheribi-Aoulmi

**References**

Imane Rezgui M.LAIB and Z.Gheribi-Aoulmi NEW SERIES OF RESOLVABLE PARTIALLY PAIRWISE BALANCED DESIGNS AND THEIR ASSOCIATED SPACE FILLING DESIGNS; accepted Proceeding on Afrika Statistika.


Examples
\[
n<-3 \\
l<-3 \\
w<-3 \\
PPrightAng(n, 1, w)
\]

---

Description

The application of the (ASC-SF) algorithm on some association schemes to obtain new series of Space-filling Design.

Usage

SpaceFilling(asch)

Arguments

ash : "character" contain the type of the association scheme used to obtain the Space Filling design, the association scheme used are :
"Div" : Group divisible association scheme.
"Rect" : Rectangular association scheme.
"Nestdiv" : Nested group divisible association scheme.
"RightAng" : Right angular association scheme.
"GrectRightAng4" : Generalized rectangular right angular association scheme(4).
"GrectRightAng5" : Generalized rectangular right angular association scheme(5).
"GrectRightAng7" : Generalized rectangular right angular association scheme(7).

Value

A LIST :
SFDesign The configuration of the Space Filling design.
Runs Number of runs in the Space-Filling design.
Factors Number of factors.
Levels Levels of factors.

Author(s)

Mohamed Laib, Imane Rezgui and Zoubida Gheribi-Aoulmi

References

Examples

    #### Space Filling obtain via Group divisible association scheme.
    # SpaceFilling("PPdiv")
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