Package ‘DiallelAnalysisR’

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Type Package
Title Diallel Analysis with R
Version 0.1.1
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Description Performs Diallel Analysis with R using Griffing’s and Hayman’s approaches. Four different methods (1: Method-I (Parents + F1’s + reciprocals); 2: Method-II (Parents and one set of F1’s); 3: Method-III (One set of F1’s and reciprocals); 4: Method-IV (One set of F1’s only)) and two methods (1: Fixed Effects Model; 2: Random Effects Model) can be applied using Griffing’s approach.
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R topics documented:

Griffing ......................................................... 2
GriffingData1 .................................................... 6
GriffingData2 .................................................... 7
GriffingData3 .................................................... 8
GriffingData4 .................................................... 9
Hayman ......................................................... 10
HaymanData ..................................................... 12

Index 14
Griffing

Description
Griffing is used for performing Diallel Analysis using Griffing’s Approach.

Usage
Griffing(y, Rep, Cross1, Cross2, data, Method, Model)

Arguments
- y: Numeric Response Vector
- Rep: Replicate as factor
- Cross1: Cross 1 as factor
- Cross2: Cross 2 as factor
- data: A data.frame
- Method: Method for Diallel Analysis using Griffing’s approach. It can take 1, 2, 3, or 4 as argument depending on the method being used.
  1. Method-I (Parents + F₁’s + reciprocals);
  2. Method-II (Parents and one set of F₁’s);
  3. Method-III (One set of F₁’s and reciprocals);
  4. Method-IV (One set of F₁’s only).
- Model: Model for Diallel Analysis using Griffing’s approach. It can take 1 or 2 as arguments depending on the model being used.
  1. Fixed Effects Model;
  2. Random Effects Model.

Details
Diallel Analysis using Griffing’s approach.

Value
- Means
- ANOVA Analysis of Variance (ANOVA) table
- Genetic Components
- Effects of Crosses
- StdErr: Standard Errors of Crosses

Author(s)
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References


See Also

*Hayman, GriffingData1, GriffingData2, GriffingData3, GriffingData4*

Examples

```r
#-----------------------------------------------------------
## Diamel Analysis with Griffing's Approach Method 1 & Model 1
#-----------------------------------------------------------
Griffing1Data1 <- Griffing(
  y = Yield
  , Rep = Rep
  , Cross1 = Cross1
  , Cross2 = Cross2
  , data = GriffingData1
  , Method = 1
  , Model = 1
)
names(Griffing1Data1)
Griffing1Data1
Griffing1Data1Means <- Griffing1Data1$Means
Griffing1Data1ANOVA <- Griffing1Data1$ANOVA
Griffing1Data1Genetic.Components <- Griffing1Data1$Genetic.Components
Griffing1Data1Effects <- Griffing1Data1$Effects
Griffing1Data1StdErr <- as.matrix(Griffing1Data1$StdErr)

#-----------------------------------------------------------
## Diamel Analysis with Griffing's Approach Method 1 & Model 2
#-----------------------------------------------------------
Griffing2Data1 <- Griffing(
  y = Yield
  , Rep = Rep
  , Cross1 = Cross1
  , Cross2 = Cross2
  , data = GriffingData1
  , Method = 1
  , Model = 2
)
names(Griffing2Data1)
Griffing2Data1
Griffing2Data1Means <- Griffing2Data1$Means
Griffing2Data1ANOVA <- Griffing2Data1$ANOVA
```
Griffing2Data1Genetic.Components <- Griffing2Data1$Genetic.Components

#-----------------------------------------------
## Diallel Analysis with Griffing's Approach Method 2 & Model 1
#-----------------------------------------------
Griffing1Data2 <- Griffing(
  y  = Yield
  , Rep = Rep
  , Cross1 = Cross1
  , Cross2 = Cross2
  , data = GriffingData2
  , Method = 2
  , Model = 1
)
names(Griffing1Data2)
Griffing1Data2
Griffing1Data2Means <- Griffing1Data2$Means
Griffing1Data2ANOVA <- Griffing1Data2$ANOVA
Griffing1Data2Genetic.Components <- Griffing1Data2$Genetic.Components
Griffing1Data2Effects <- Griffing1Data2$Effects
Griffing1Data2StdErr <- as.matrix(Griffing1Data2$StdErr)

#-----------------------------------------------
## Diallel Analysis with Griffing's Approach Method 2 & Model 2
#-----------------------------------------------
Griffing2Data2 <- Griffing(
  y  = Yield
  , Rep = Rep
  , Cross1 = Cross1
  , Cross2 = Cross2
  , data = GriffingData2
  , Method = 2
  , Model = 2
)
names(Griffing2Data2)
Griffing2Data2
Griffing2Data2Means <- Griffing2Data2$Means
Griffing2Data2ANOVA <- Griffing2Data2$ANOVA
Griffing2Data2Genetic.Components <- Griffing2Data2$Genetic.Components

#-----------------------------------------------
## Diallel Analysis with Griffing's Approach Method 3 & Model 1
#-----------------------------------------------
Griffing1Data3 <- Griffing(
  y  = Yield
  , Rep = Rep
  , Cross1 = Cross1

Griffing

```r
, Cross2 = Cross2
, data  = GriffingData3
, Method = 3
, Model = 1
)
names(Griffing1Data3)
Griffing1Data3
Griffing1Data3Means <- Griffing1Data3$Means
Griffing1Data3ANOVA <- Griffing1Data3$ANOVA
Griffing1Data3Genetic.Components <- Griffing1Data3$Genetic.Components
Griffing1Data3Effects <- Griffing1Data3$Effects
Griffing1Data3StdErr <- as.matrix(Griffing1Data3$StdErr)

#---------------------------------------------------------------
## Diallel Analysis with Griffing's Approach Method 3 & Model 2
#---------------------------------------------------------------
Griffing2Data3 <-
Griffing(
  y   = Yield
, Rep = Rep
, Cross1 = Cross1
, Cross2 = Cross2
, data = GriffingData3
, Method = 3
, Model = 2
)
names(Griffing2Data3)
Griffing2Data3
Griffing2Data3Means <- Griffing2Data3$Means
Griffing2Data3ANOVA <- Griffing2Data3$ANOVA
Griffing2Data3Genetic.Components <- Griffing2Data3$Genetic.Components

#---------------------------------------------------------------
## Diallel Analysis with Griffing's Approach Method 4 & Model 1
#---------------------------------------------------------------
Griffing1Data4 <-
Griffing(
  y   = Yield
, Rep = Rep
, Cross1 = Cross1
, Cross2 = Cross2
, data = GriffingData4
, Method = 4
, Model = 1
)
names(Griffing1Data4)
Griffing1Data4
Griffing1Data4Means <- Griffing1Data4$Means
Griffing1Data4ANOVA <- Griffing1Data4$ANOVA
Griffing1Data4Genetic.Components <- Griffing1Data4$Genetic.Components
Griffing1Data4Effects <- Griffing1Data4$Effects
```
GriffingData1

Data for Diallel Analysis using Griffing Approach Method 1

Description

Griffing is used for performing Diallel Analysis using Griffing’s Approach.

Usage

data(GriffingData1)

Format

A data.frame with 256 rows and 4 variables.

Details

• Cross1 Cross 1
• Cross2 Cross 2
• Rep Replicate
• Yield Yield Response

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---

GriffingData4StdErr <- as.matrix(GriffingData4$StdErr)

#-------------------------------------------
## Diallel Analysis with Griffing’s Approach Method 4 & Model 2
#-------------------------------------------
Griffing2Data4 <- GriffinPanel(
    y = Yield,
    , Rep = Rep
    , Cross1 = Cross1
    , Cross2 = Cross2
    , data = GriffingData4
    , Method = 4
    , Model = 2
)

names(Griffing2Data4)
Griffing2Data4
Griffing2Data4Means <- Griffing2Data4$Means
Griffing2Data4ANOVA <- Griffing2Data4$ANOVA
Griffing2Data4Genetic.Components <- Griffing2Data4$Genetic.Components
GriffingData2

References


See Also

Griffing, GriffingData2, GriffingData3, GriffingData4

Examples

```r
data(G riffingData 1)
```

---

**GriffingData2**  
*Data for Diallel Analysis using Griffing Approach Method 2*

Description

Griffing is used for performing Diallel Analysis using Griffing’s Approach.

Usage

```r
data(G riffingData2)
```

Format

A `data.frame` with 144 rows and 4 variables.

Details

- Cross1 Cross 1
- Cross2 Cross 2
- Rep Replicate
- Yield Yield Response

Author(s)

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References


See Also

Griffing, GriffingData1, GriffingData3, GriffingData4

Examples

data(GriffingData2)

data(GriffingData3)

GriffingData3

Data for Diallel Analysis using Griffing Approach Method 3

Description

Griffing is used for performing Diallel Analysis using Griffing’s Approach.

Usage

data(GriffingData3)

Format

A data.frame with 224 rows and 4 variables.

Details

- Cross1 Cross 1
- Cross2 Cross 2
- Rep Replicate
- Yield Yield Response

Author(s)

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References


See Also

Griffing, GriffingData1, GriffingData2, GriffingData4

Examples

data(GriffingData3)
**GriffingData4**

Data for Diallel Analysis using Griffing Approach Method 4

**Description**

Griffing is used for performing Diallel Analysis using Griffing’s Approach.

**Usage**

data(GriffingData4)

**Format**

A data.frame with 112 rows and 4 variables.

**Details**

- Cross1 Cross 1
- Cross2 Cross 2
- Rep Replicate
- Yield Yield Response

**Author(s)**

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**References**


**See Also**

Griffing, GriffingData1, GriffingData2, GriffingData3

**Examples**

data(GriffingData4)
Hayman

**Diallel Analysis using Hayman Approach**

**Description**

Hayman is used for performing Diallel Analysis using Hayman's Approach.

**Usage**

Hayman(y, Rep, Cross1, Cross2, data)

**Arguments**

- y: Numeric Response Vector
- Rep: Replicate as factor
- Cross1: Cross 1 as factor
- Cross2: Cross 2 as factor
- data: A data.frame

**Details**

Diallel Analysis using Hayman's approach.

**Value**

- Means: Means
- ANOVA: Analysis of Variance (ANOVA) table
- Genetic Components: Genetic Components
- Effects: Effects of Crosses
- StdErr: Standard Errors of Crosses

**Author(s)**

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**References**

Hayman

See Also

Griffing.HaymanData

Examples

#-----------------------------------------------
## Diallel Analysis with Hayman's Approach
#-----------------------------------------------

Hayman1Data <-
    Hayman(
        y = Yield,
        Rep = Rep,
        Cross1 = Cross1,
        Cross2 = Cross2,
        data = Haymandata
    )

Hayman1Data
names(Hayman1Data)

Hayman1DataMeans <- Hayman1Data$Means
Hayman1DataANOVA <- Hayman1Data$ANOVA
Hayman1DataWr.Vr.Table <- Hayman1Data$Wr.Vr.Table

Hayman1DataComponents.of.Variation <- Hayman1Data$Components.of.Variation
Hayman1DataOther.Parameters <- Hayman1Data$Other.Parameters
Hayman1DataFr <- Hayman1Data$Fr

#---------------------
# Wr-Vr Graph
#---------------------

VOLO <- Hayman1Data$VOLO
In.Value <- Hayman1Data$In.Value
a <- Hayman1Data$a
b <- Hayman1Data$b
Wr.Vr <- Hayman1Data$Wr.Vr.Table

library(ggplot2)

ggplot(data=data.frame(x=c(0, max(In.Value, Wr.Vr$Wr, Wr.Vr$Wr, Wr.Vr$Vrei))),
    aes(x)) +
    stat_function(fun=function(x) {sqrt(x*VOLO)}, color="blue") +
    geom_hline(yintercept = 0) +
    geom_vline(xintercept = 0) +
    geom_abline(intercept = a, slope = b) +
    geom_abline(intercept = mean(Wr.Vr$Wr)-mean(Wr.Vr$Vr), slope = 1) +
    geom_segment(aes(
        x = mean(Wr.Vr$Wr),
        y = min(0, mean(Wr.Vr$Wr)),
        xend = mean(Wr.Vr$Wr),
        yend = max(0, mean(Wr.Vr$Wr))
    )
)
Description

Griffing is used for performing Diallel Analysis using Hayman’s Approach.

Usage

data(HaymanData)

Format

A data.frame with 256 rows and 4 variables.

Details

- Cross1 Cross 1
- Cross2 Cross 2
- Rep Replicate
- Yield Yield Response

Author(s)

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References


2. Test

Examples

data(HaymanData)
Index

*Topic datasets
GriffingData1, 6
GriffingData2, 7
GriffingData3, 8
GriffingData4, 9
HaymanData, 12

Griffing, 2, 7–9, 11
GriffingData1, 3, 6, 8, 9
GriffingData2, 3, 7, 7, 8, 9
GriffingData3, 3, 7, 8, 8, 9
GriffingData4, 3, 7, 8, 9

Hayman, 3, 10
HaymanData, 11, 12