

Package ‘DEFormats’

June 8, 2023

Type Package

Title Differential gene expression data formats converter

Version 1.28.0

Encoding UTF-8

Author Andrzej Oleś

Maintainer Andrzej Oleś <andrzej.oles@gmail.com>

URL <https://github.com/aoles/DEFormats>

BugReports <https://github.com/aoles/DEFormats/issues>

Description Convert between different data formats used by differential gene expression analysis tools.

License GPL-3

Imports checkmate, data.table, DESeq2, edgeR (>= 3.13.4),
GenomicRanges, methods, S4Vectors, stats, SummarizedExperiment

Suggests BiocStyle (>= 1.8.0), knitr, rmarkdown, testthat

VignetteBuilder knitr

biocViews ImmunoOncology, DifferentialExpression, GeneExpression,
RNASeq, Sequencing, Transcription

RoxygenNote 7.2.3

git_url <https://git.bioconductor.org/packages/DEFormats>

git_branch RELEASE_3_17

git_last_commit 208c3aa

git_last_commit_date 2023-04-25

Date/Publication 2023-06-08

R topics documented:

as.DESeqDataSet	2
as.DGEList	3
DEFormats	4

DGEList	4
simulateNormFactors	6
simulateRnaSeqData	7
Index	9

as.DESeqDataSet	<i>Convert to DESeqDataSet</i>
-----------------	--------------------------------

Description

Coerces an object to [DESeqDataSet](#).

Usage

```
as.DESeqDataSet(x, ...)

## S3 method for class 'DGEList'
as.DESeqDataSet(x, ...)
```

Arguments

x	an R object
...	additional arguments to be passed to methods

Value

A [DESeqDataSet](#) object

Methods (by class)

- `as.DESeqDataSet(DGEList)`: Coerce [DGEList-class](#) objects to [DESeqDataSet](#).

Author(s)

Andrzej Oleś <<andrzej.oles@gmail.com>>, 2016-2023

See Also

[as.DGEList](#)

Examples

```
require("edgeR")

counts = simulateRnaSeqData()
group = rep(c("case", "control"), each = 3)

dge = DGEList(counts = counts, group = group)
dge

as.DESeqDataSet(dge)
```

as.DGEList

Convert to DGEList

Description

Coerces an object to [DGEList](#).

Usage

```
as.DGEList(x, ...)

## S3 method for class 'DESeqDataSet'
as.DGEList(x, ...)
```

Arguments

x an R object
... additional arguments to be passed to methods

Value

A [DGEList](#) object.

Methods (by class)

- `as.DGEList(DESeqDataSet)`: Coerce [DESeqDataSet](#) objects to [DGEList-class](#).

Author(s)

Andrzej Oleś <<andrzej.oles@gmail.com>>, 2016-2023

See Also

[as.DESeqDataSet](#)

Examples

```
require("DESeq2")

se = simulateRnaSeqData(output = "RangedSummarizedExperiment")
se

dds = DESeqDataSet(se, design = ~ condition)
dds

as.DGEList(dds)
```

DEFormats

Convert Between Differential Gene Expression Data Formats

Description

DEFormats provides data converters between various formats used by different gene expression analysis packages.

Details

Currently the package supports data conversion between **DESeq2** and **edgeR**, i.e., between [DESeqDataSet](#) and [DGEList](#) objects, respectively.

Objects can be coerced using the following methods

- [as.DESeqDataSet](#)
- [as.DGEList](#)

Author(s)

Andrzej Oleś <<andrzej.oles@gmail.com>>, 2016-2023

DGEList

DGEList Constructor Generic

Description

Creates a [DGEList](#) object.

Usage

```

DGEList(counts, ...)

## S4 method for signature 'RangedSummarizedExperiment'
DGEList(
  counts = new("RangedSummarizedExperiment"),
  lib.size = colData(counts)$lib.size,
  norm.factors = colData(counts)$norm.factors,
  samples = colData(counts),
  group = NULL,
  genes = as.data.frame(rowRanges(counts)),
  remove.zeros = FALSE
)

```

Arguments

counts	read counts, either a numeric matrix or a RangedSummarizedExperiment object.
...	other arguments are not currently used.
lib.size	numeric vector of library sizes (sequencing depths) for the samples. Defaults to colSums(counts).
norm.factors	numeric vector of normalization factors that modify the library sizes. Defaults to a vector of ones.
samples	data.frame containing sample information, with a row for each sample. This data.frame will be appended to the samples component of the DGEList object.
group	vector or factor giving the experimental group or treatment condition for each sample. Defaults to a single group.
genes	data.frame containing gene annotation.
remove.zeros	logical, whether to remove rows that have 0 total count.

Value

A [DGEList](#) object.

Author(s)

Andrzej Oleś <<andrzej.oles@gmail.com>>, 2016-2023

Examples

```

se = simulateRnaSeqData(output = "RangedSummarizedExperiment")

## Initialize a DGEList from a RangedSummarizedExperiment object
DGEList(se)

```

simulateNormFactors *Simulate Normalization Factors*

Description

Simulate gene-specific normalization factors for each sample of an RNA-seq experiment.

Usage

```
simulateNormFactors(n = 1000L, m = 6L, seed = 0L, ...)
```

Arguments

n	number of genes
m	number of samples
seed	a single integer value specifying the random number generator seed
...	arguments passed to matrix

Value

A matrix with n rows and m columns containing the normalization factors.

Author(s)

Andrzej Oleś <<andrzej.oles@gmail.com>>, 2016-2023

See Also

[simulateRnaSeqData](#)

Examples

```
require("DESeq2")

## normalization factors
se = simulateRnaSeqData(output = "RangedSummarizedExperiment")

dds = DESeqDataSet(se, design = ~ condition)

normalizationFactors(dds) = simulateNormFactors()
```

simulateRnaSeqData *Example counts table of RNA-seq data*

Description

Simulated expression data of an RNA-seq experiment.

Usage

```
simulateRnaSeqData(  
  output = c("matrix", "RangedSummarizedExperiment"),  
  n = 1000,  
  m = 6,  
  seed = 0L,  
  ...  
)
```

Arguments

output	output type
n	number of genes
m	number of samples
seed	a single integer value specifying the random number generator seed
...	arguments passed to makeExampleDESeqDataSet

Details

The count table is generated using the [makeExampleDESeqDataSet](#) method from the **DESeq2** package.

Value

Depending on the output setting a matrix or an [RangedSummarizedExperiment](#) object.

Author(s)

Andrzej Oleś <<andrzej.oles@gmail.com>>, 2016-2023

See Also

[simulateNormFactors](#)

Examples

```
## count data matrix
mx = simulateRnaSeqData()
head(mx)

## return an RangedSummarizedExperiment object
se = simulateRnaSeqData(output = "RangedSummarizedExperiment")
se
```


Index

`as.DESeqDataSet`, [2](#), [3](#), [4](#)

`as.DGEList`, [2](#), [3](#), [4](#)

`DEFormats`, [4](#)

`DESeqDataSet`, [2–4](#)

`DGEList`, [3](#), [4](#), [4](#), [5](#)

`DGEList`, `RangedSummarizedExperiment`-method
(`DGEList`), [4](#)

`makeExampleDESeqDataSet`, [7](#)

`matrix`, [6](#)

`RangedSummarizedExperiment`, [5](#), [7](#)

`simulateNormFactors`, [6](#)

`simulateRnaSeqData`, [7](#)