Package 'DelayedDataFrame'

July 15, 2025

Title Delayed operation on DataFrame using standard DataFrame metaphor

Version 1.25.0

Description Based on the standard DataFrame metaphor, we are trying to implement the feature of delayed operation on the DelayedDataFrame, with a slot of lazyIndex, which saves the mapping indexes for each column of DelayedDataFrame. Methods like show, validity check, [/[[subsetting, rbind/cbind are implemented for DelayedDataFrame to be operated around lazyIndex. The listData slot stays untouched until a realization call e.g., DataFrame constructor OR as.list() is invoked.

biocViews Infrastructure, DataRepresentation

Depends R (>= 3.6), S4Vectors (>= 0.23.19), DelayedArray (>= 0.7.5)

License GPL-3

Encoding UTF-8

URL https://github.com/Bioconductor/DelayedDataFrame

BugReports https://github.com/Bioconductor/DelayedDataFrame/issues

Imports methods, stats, BiocGenerics

RoxygenNote 7.0.2

Suggests testthat, knitr, rmarkdown, BiocStyle, SeqArray, GDSArray

Collate LazyIndex-class.R DelayedDataFrame-class.R DelayedDataFrame-method.R

VignetteBuilder knitr

git_url https://git.bioconductor.org/packages/DelayedDataFrame

git_branch devel

git_last_commit 38233f8

git_last_commit_date 2025-04-15

Repository Bioconductor 3.22

Date/Publication 2025-07-15

Author Qian Liu [aut, cre], Hervé Pagès [aut], Martin Morgan [aut]

Maintainer Qian Liu <Qian.Liu@roswellpark.org>

Contents

as.list,DelayedDataFrame-method 2
DelayedDataFrame 3
LazyIndex-class 4

Index **6**

`as.list,DelayedDataFrame-method`
DelayedDataFrame related methods.

Description

`as.list`, `rbind` would incur realization of the `lazyIndex` slot in `DelayedDataFrame` object.

`cbind` for DelayedDataFrame inherits the lazyIndex's if inputs have any DelayedDataFrame objects. Otherwise, return a new DelayedDataFrame with NULL lazyIndexes.

Usage

```
## S4 method for signature 'DelayedDataFrame'
as.list(x, use.names = TRUE)

## S4 method for signature 'DelayedDataFrame'
names(x)

## S4 method for signature 'DelayedDataFrame'
cbind(..., deparse.level = 1)

## S4 method for signature 'DelayedDataFrame'
bindROWS(
  x,
  objects = list(),
  use.names = TRUE,
  ignore.mcols = FALSE,
  check = TRUE
)

## S4 method for signature 'DelayedDataFrame,ANY'
extractROWS(x, i)

## S4 method for signature 'DelayedDataFrame'
extractCOLS(x, i)

## S4 method for signature 'DelayedDataFrame'
replaceCOLS(x, i, value)

## S4 method for signature 'DelayedDataFrame'
mergeROWS(x, i, value)

## S4 method for signature 'DelayedDataFrame,ANY,ANY,ANY'
x[i, j, ..., drop = TRUE]
```

Arguments

x	as.list,DelayedDataFrame: a DelayedDataFrame object. OR, [,DelayedDataFrame: DelayedDataFrame object to be subsetted.
use.names	as.list,DelayedDataFrame: whether to use the colnames of DelayedDataFrame as the names for the returned list. OR, bindROWS,DelayedDataFrame: whether to use rownames of the input arguments. Default is TRUE.
...	cbind,DelayedDataFrame: One or more vector-like or matrix-like objects. These can be given as named arguments. OR, [,DelayedDataFrame: other arguments to pass.
deparse.level	See '?base::cbind' for a description of this argument.
objects	the DelayedDataFrame objects to be passed into bindROWS.
ignore.mcols	Logical. This argument is ignored for bindROWS,DelayedDataFrame.
check	Logical. This argument is ignored for bindROWS,DelayedDataFrame.
i	row subscript
value	the new values in the i,j subscripts of DelayedDataFrame object.
j	col subscript
drop	if drop with reduced dimension, default is TRUE.

Value

colnames of DelayedDataFrame

DelayedDataFrame *DelayedDataFrame-class*

Description

The DelayedDataFrame class extends the DataFrame class and supports the storage of any type of object (with 'length' and '[' methods) as columns.

the lazyIndex slot getter and setter for DelayedDataFrame object.

the coercion method between DataFrame and DelayedDataFrame objects.

Usage

```
DelayedDataFrame(..., row.names = NULL, check.names = TRUE)

## S4 method for signature 'DelayedDataFrame'
lazyIndex(x)

.from_DataFrame_to_DelayedDataFrame(from)

.from_DelayedDataFrame_to_DFrame(from, to = "DFrame", strict = TRUE)

lazyIndex(x) <- value

## S4 replacement method for signature 'DelayedDataFrame'
lazyIndex(x) <- value
```

Arguments

...	the arguments to pass into construction of a new DelayedDataFrame.
row.names	the rownames for the newly constructed DelayedDataFrame object.
check.names	logical. If 'TRUE' then the names of the variables in the DelayedDataFrame are checked to ensure that they are syntactically valid variable names and are not duplicated. If necessary they are adjusted (by 'make.names') so that they are.
x	the DelayedDataFrame object.
from	the object to be converted.
to	the class of object to be returned by coercion.
strict	Logical. Whether to force return a DataFrame.
value	the new value of lazyIndex slot for DelayedDataFrame object.

Details

The DelayedDataFrame inherits from DataFrame and behaves very similarily in terms of construction, subsetting, splitting, combining, etc. The most notable exception is that The additional slot of lazyIndex, enables DelayedArray (with different back-ends) columns to share indexes when possible.

Please be very careful to use this replace method for lazyIndex slot. Because it only replace the lazyIndex slot, but not necessarily the nrow and rownames slots. If you want to have synchronized subsetting for all slots, the [method should be used.

Value

lazyIndex<-: the DelayedDataFrame object with new value of lazyIndex slot.

Examples

```
DDF <- DelayedDataFrame(letters, LETTERS)
DDF1 <- DDF[1:10,]
DDF1
lazyIndex(DDF1)
as(DDF1, "DataFrame")
```

LazyIndex-class *The* LazyIndex *class and methods.*

Description

The LazyIndex class is designed to carry mapping indexes for DelayedDataFrame columns. So that some operations (e.g., subsetting) on DelayedDataFrame are delayed until a realization call is incurred. (e.g., as.list(), DataFrame(), ...)

LazyIndex constructor.

the subsetting method for LazyIndex object.

Usage

```
LazyIndex(listData = list(), index = integer())

## S4 method for signature 'LazyIndex'
cbind(..., deparse.level = 1)

## S4 method for signature 'LazyIndex,ANY,ANY,ANY'
x[i, j, ..., drop = TRUE]
```

Arguments

listData	the list data for all mapping indexes that are used in corresponding DelayedDataFrame object.
index	the position of mapping indexes in listData for each column of the corresponding DelayedDataFrame object.
...	LazyIndex objects.
deparse.level	See ?base::cbind for a description of this argument.
x	LazyIndex object.
i	row subscript for LazyIndex, which will subset the listData slot.
j	column subscript for LazyIndex, which will subset the index slot.
drop	Logical. Wheter to drop the dimension if any of the dimensions has length 1. Default is TRUE.

Details

the cbind,LazyIndex method is defined to bind the LazyIndexes column-wise when cbind,DelayedDataFrame function is called.

Value

a LazyIndex object.

Index

.DelayedDataFrame *(DelayedDataFrame)*, 3
.LazyIndex *(LazyIndex-class)*, 4
.from_DataFrame_to_DelayedDataFrame *(DelayedDataFrame)*, 3
.from_DelayedDataFrame_to_DFrame *(DelayedDataFrame)*, 3
[,DelayedDataFrame,ANY,ANY,ANY-method *(as.list,DelayedDataFrame-method)*, 2
[,LazyIndex,ANY,ANY,ANY-method *(LazyIndex-class)*, 4
[,LazyIndex-method *(LazyIndex-class)*, 4

as.list,DelayedDataFrame-method, 2

bindROWS,DelayedDataFrame-method *(as.list,DelayedDataFrame-method)*, 2

cbind,DelayedDataFrame-method *(as.list,DelayedDataFrame-method)*, 2
cbind,LazyIndex-method *(LazyIndex-class)*, 4
coerce *(DelayedDataFrame)*, 3
coerce,ANY,DelayedDataFrame-method *(DelayedDataFrame)*, 3
coerce,DataFrame,DelayedDataFrame-method *(DelayedDataFrame)*, 3
coerce,DelayedDataFrame,DataFrame-method *(DelayedDataFrame)*, 3
coerce,DelayedDataFrame,DFrame-method *(DelayedDataFrame)*, 3
coerce,DFrame,DelayedDataFrame-method *(DelayedDataFrame)*, 3

DelayedDataFrame, 3
DelayedDataFrame-class *(DelayedDataFrame)*, 3

extractCOLS,DelayedDataFrame-method *(as.list,DelayedDataFrame-method)*, 2
extractROWS,DelayedDataFrame,ANY-method *(as.list,DelayedDataFrame-method)*, 2
extractROWS,DelayedDataFrame-method *(as.list,DelayedDataFrame-method)*, 2

LazyIndex *(LazyIndex-class)*, 4
lazyIndex *(DelayedDataFrame)*, 3
lazyIndex,DelayedDataFrame *(DelayedDataFrame)*, 3
lazyIndex,DelayedDataFrame-method *(DelayedDataFrame)*, 3
LazyIndex-class, 4
lazyIndex<- *(DelayedDataFrame)*, 3
lazyIndex<-, *(DelayedDataFrame)*, 3
lazyIndex<-,DelayedDataFrame-method *(DelayedDataFrame)*, 3

mergeROWS,DelayedDataFrame-method *(as.list,DelayedDataFrame-method)*, 2

names,DelayedDataFrame-method *(as.list,DelayedDataFrame-method)*, 2

replaceCOLS,DelayedDataFrame-method *(as.list,DelayedDataFrame-method)*, 2