

# Package ‘DelayedDataFrame’

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**Title** Delayed operation on DataFrame using standard DataFrame metaphor

**Version** 1.26.0

**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

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

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## 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

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DelayedDataFrame      *DelayedDataFrame-class*

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**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 similarly 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")
```

## 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 <code>DelayedDataFrame</code> object.
index	the position of mapping indexes in <code>listData</code> for each column of the corresponding <code>DelayedDataFrame</code> object.
...	<code>LazyIndex</code> objects.
deparse.level	See <code>?base::cbind</code> for a description of this argument.
x	<code>LazyIndex</code> object.
i	row subscript for <code>LazyIndex</code> , which will subset the <code>listData</code> slot.
j	column subscript for <code>LazyIndex</code> , which will subset the <code>index</code> slot.
drop	Logical. Whether 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 `LazyIndex`es column-wise when `cbind`, `DelayedDataFrame` function is called.

**Value**

a `LazyIndex` object.

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