Package ‘jdx’

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Type Package

Title 'Java' Data Exchange for 'R' and 'rJava'

Description Simplifies and extends data exchange between 'R' and 'Java'.

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URL https://github.com/floidgilbert/jdx

BugReports https://github.com/floidgilbert/jdx/issues

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Description

Builds on rJava to simplify and extend data exchange between R and Java.

Details

The jdx package works in conjunction with rJava to provide a low-level interface for the Java platform. The jdx package was originally developed to provide data exchange functionality for jsr223, the high-level scripting interface for the Java platform. We provide jdx to developers who may want to extend existing rJava solutions. For developers of new applications, we suggest the jsr223 package for rapid application development with a relatively low learning curve.

The jdx package converts R data structures to generic Java objects and vice versa. In particular, R vectors, n-dimensional arrays, factors, data frames, tables, environments, and lists are converted to Java objects. Java scalars and n-dimensional arrays are converted to R vectors and n-dimensional arrays. Java maps and collections are converted to R lists, data frames, vectors, or n-dimensional arrays depending on content. Several options are available for data conversion including row-major and column-major ordering for arrays and data frames.

For sites that plan on designing and distributing packages that depend on jdx, it may be helpful to know that the jdx package does not use or load rJava’s companion package JRI (the Java/R Interface).

For best results, please refer to the vignette Introduction to jdx: Java Data Exchange for R and rJava.

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See Also

convertToJava, convertToR, getJavaClassName

Examples

library("jdx")

# Convert matrix using column-major ordering
m <- matrix(1:4, 2, 2)
o = convertToJava(m, array.order = "column-major")
getJavaClassName(o)
identical(m, convertToR(o, array.order = "column-major"))

# Convert 4-dimensional array using row-major ordering
dimensions <- c(3, 2, 2, 2)
a = array(1:prod(dimensions), dimensions)
o = convertToJava(a, array.order = "row-major")
getJavaClassName(o)
identical(a, convertToR(o, array.order = "row-major"))

# Convert data frame
identical(iris, convertToR(convertToJava(iris)))

# Demonstrate exact double precision
identical(pi, convertToR(convertToJava(pi, scalars.as.objects = TRUE))))

---

**convertToJava**  
*Convert R Objects to Java Objects*

**Description**

The function `convertToJava` converts R objects to generic Java objects for use with the `rJava` package. This function simplifies and extends data exchange for `rJava`. The function `convertToJava` is the inverse of `convertToR`.

**Usage**

```r
convertToJava(
  value,
  length.one.vector.as.array = FALSE,
  scalars.as.objects = FALSE,
  array.order = "row-major",
  data.frame.row.major = TRUE,
  coerce.factors = TRUE
)
```

**Arguments**

- **value**: An R vector, matrix, n-dimensional array, table, factor, data frame, list, or environment. Nested lists are supported. Supported data types: numeric, integer, character, logical, and raw.

- **length.one.vector.as.array**: A logical vector of length one. See R Vectors of Length One in the vignette.

- **scalars.as.objects**: A logical vector of length one. See R Vectors of Length One in the vignette.

- **array.order**: A character vector of length one specifying the order when copying R n-dimensional arrays to Java. Valid values are "row-major", "column-major", and "column-minor". See R Matrices and N-dimensional Arrays in the vignette.

- **data.frame.row.major**: A logical vector of length one. When TRUE (the default), a data frame is converted to a list of map objects that represent rows. When FALSE, a data frame is converted to a map of arrays that represent columns. Conversion for column-major order is much faster than row-major order. See R Data Frames in the vignette.
coerce.factors A logical vector of length one. When TRUE (the default), an attempt is made to
coerce the character values backing factors to integer, numeric, or logical vec-
tors. If coercion fails, the factor is converted to a character vector. When FALSE,
the factor is converted to a character vector. This parameter affects standalone
factors as well as factors present in data frames and lists. See R Factors in the
vignette.

Details

The convertToJava function is used to create objects that can be used as method parameters in
the rJava package. R vectors, matrices, n-dimensional arrays, tables, factors, data frames, envi-
enments, lists, named lists, and nested lists are supported as well as data types numeric, integer,
logical, character and raw.

The vignette contains all documentation for convertToJava and its inverse function convertToR.
Note that these functions are not always perfect inverses of each other. See Conversion Issues for
more information.

Value

A Java object reference or an R vector. See the vignette for details.

See Also

convertToR, getJavaClassName

Examples

library("jdx")

# Convert matrix using column-major ordering
m <- matrix(1:4, 2, 2)
o = convertToJava(m, array.order = "column-major")
getJavaClassName(o)
identical(m, convertToR(o, array.order = "column-major"))

# Convert 4-dimensional array using row-major ordering
dimensions <- c(3, 2, 2, 2)
a = array(1:prod(dimensions), dimensions)
o = convertToJava(a, array.order = "row-major")
getJavaClassName(o)
identical(a, convertToR(o, array.order = "row-major"))

# Convert data frame
identical(iris, convertToR(convertToJava(iris)))

# Demonstrate exact double precision
identical(pi, convertToR(convertToJava(pi, scalars.as.objects = TRUE)))
convertToR

\textit{Convert Java Objects to R Objects}

\noindent \textbf{Description}

The function \texttt{convertToR} converts the Java objects referenced by \texttt{rJava} objects to R objects. The function \texttt{convertToR} is the inverse of \texttt{convertToJava}.

\noindent \textbf{Usage}

\begin{verbatim}
convertToR(
  value,
  strings.as.factors = NULL,
  array.order = "row-major"
)
\end{verbatim}

\noindent \textbf{Arguments}

\begin{description}
\item \texttt{value} An \texttt{rJava} object reference.
\item \texttt{strings.as.factors} A logical vector of length one specifying whether string vectors are automatically converted to factors when Java objects are converted to R data frames. This parameter is discussed in the vignette under \texttt{Java Maps}.
\item \texttt{array.order} A character vector of length one specifying the order used to copy Java n-dimensional arrays to R. Valid values are "row-major", "column-major", and "column-minor". See \texttt{Java One-dimensional Arrays and N-dimensional Rectangular Arrays} in the vignette.
\end{description}

\noindent \textbf{Details}

The \texttt{convertToR} function is not thread-safe. Do not simultaneously call \texttt{convertToR} from different threads in the same process. A thread-safe alternative is presented in the R documentation for \texttt{convertToRlowLevel}.

The vignette contains all documentation for \texttt{convertToR} and its inverse function \texttt{convertToJava}. Note that these functions are not always perfect inverses of each other. See \texttt{Conversion Issues} for more information.

\noindent \textbf{Value}

An R object. See the vignette for details.

\noindent \textbf{See Also}

\texttt{convertToJava, getJavaClassName}
Examples

```r
library("jdx")

# Convert matrix using column-major ordering
m <- matrix(1:4, 2, 2)
o = convertToJava(m, array.order = "column-major")
getJavaClassName(o)
identical(m, convertToR(o, array.order = "column-major"))

# Convert 4-dimensional array using row-major ordering
dimensions <- c(3, 2, 2, 2)
a = array(1:prod(dimensions), dimensions)
o = convertToJava(a, array.order = "row-major")
getJavaClassName(o)
identical(a, convertToR(o, array.order = "row-major"))

# Convert data frame
identical(iris, convertToR(convertToJava(iris)))

# Demonstrate exact double precision
identical(pi, convertToR(convertToJava(pi, scalars.as.objects = TRUE)))
```

convertToRlowLevel  

Low-level Interface for jdx

Description

The functions listed here are the low-level interface for `jdx` and are primarily used behind the scenes in `jsr223`, the high-level integration package for Java. However, these functions may also be useful for `rJava` developers interested in a thread-safe alternative to `convertToR`. See the code examples for a brief outline. If multi-threaded access is not required, please use `convertToR`.

Usage

```
arrayOrderToString(value)

convertToRlowLevel(
  j2r,
  data.code = NULL,
  strings.as.factors = NULL
)

createJavaToObject()

jdxConstants()

processCompositeDataCode(
  j2r,
```
Arguments

value
An \texttt{rJava} object reference to a \texttt{org.fgilbert.jdx.JavaToR$ArrayOrder} enumeration value.

\textit{j2r}
An \texttt{rJava} object reference to a \texttt{org.fgilbert.jdx.JavaToR} object. The \texttt{createJavaToRobject} function creates an instance.

data.code
A \texttt{jdx} data code value created with \texttt{processCompositeDataCode}.

\textit{strings.as.factors}
Same as in \texttt{convertToR}.

\textit{composite.data.code}
A \texttt{jdx} composite data code returned by the \texttt{initialize} method of \texttt{org.fgilbert.jdx.JavaToR}.

\textit{throw.exceptions}
A logical value indicating whether to throw exceptions.

\textit{warn.missing.logical}
A logical value indicating whether to raise a specific warning.

\textit{warn.missing.raw}
A logical value indicating whether to raise a specific warning.

Details

See the code examples below for a thread-safe alternative to \texttt{convertToR}. The low-level functional interface presented here is awkward, but it was designed to limit type inference and the number of transactions between R and the JVM, ultimately maximizing performance for \texttt{jsr223}.

See Also

\texttt{convertToJava, convertToR, getJavaClassName}

Examples

library("jdx")

# Create \texttt{org.fgilbert.jdx.JavaToR} object used to convert
# java objects to R objects. Create one of these objects
# per thread for thread-safe execution.
#
# It is also possible to create and use the JavaToR
# object in Java and return a reference to R via \texttt{rJava}.
\texttt{j2r} \leftarrow \texttt{createJavaToRobject()}

# Pass the Java object to be converted to the initialize
# method of the JavaToR object. Note that the Java object
# must be cast as \texttt{java.lang.Object}. The initialize method
getJavaClassName

Get a Java Object’s Class Name

Description

The function `getJavaClassName` returns the class name for the Java object behind an `rJava` object reference.

Usage

`getJavaClassName(value)`

Arguments

- `value` An `rJava` object reference.

Value

A character vector of length one containing the class name of the Java object.
getJavaClassName

See Also

convertToJava, convertToR

Examples

library("jdx")
getJavaClassName(convertToJava(matrix(1:4, 2, 2)))
getJavaClassName(convertToJava(iris))
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