Package 'OhdsiRTools'

May 28, 2018

Type Package

Title Tools Used by 'Observational Health Data Science and Informatics' ('OHDSI')

Version 1.5.4

Date 2018-05-28

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Description
Includes functions to format and check syntax of R code and packages following the 'OHDSI' R style guidelines. Support for parallel computation, logging, and function automation. Functionality
for interacting with instances of the open source `OHDSI` `WebApi'.

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VignetteBuilder knitr

Depends R (>= 3.1.0)

Imports devtools,
codetools,
formatR,
snow,
RJSONIO,
httr (>= 1.3.1),
XML,
jsonlite,
methods,
utils,
mailR

Suggests testthat,
shiny,
DT,
knitr,
rmarkdown

NeedsCompilation no

RoxygenNote 6.0.1.9000

R topics documented:

`addDefaultConsoleLogger` *Add the default console logger*

Description

Add the default console logger

Usage

```
addDefaultConsoleLogger()
```

Details

Creates a logger that writes to the console using the "INFO" threshold and the `layoutSimple` layout.

`addDefaultFileLogger` *Add the default file logger*

Description

Add the default file logger

Usage

```
addDefaultFileLogger(fileName)
```

Arguments

`fileName`	The name of the file to write to.

Details

Creates a logger that writes to a file using the "TRACE" threshold and the `layoutParallel` layout. The output can be viewed with the built-in log viewer tht can be started using `launchLogViewer`.

checkUsagePackage *Check all code in a package*

Description

Check all code in a package

Usage

```
checkUsagePackage(package, ignoreHiddenFunctions = TRUE,
  suppressBindingKeywords = c("ggplot2", "ffwhich", "subset.ffdf", "glm"))
```

Arguments

package	The name of the package to check.
ignoreHiddenFunctions	Ignore functions for which the definition cannot be retrieved?
suppressBindingKeywords	A set of keywords that are indicative of non-standard evaluation.

Details

This function uses the codetools package to check the code from problems. Heuristics are used to elimite false positives due to non-standard evaluation.

clearLoggers *Remove all registered loggers*

Description

Remove all registered loggers

Usage

```
clearLoggers()
```

`clusterApply` *Apply a function to a list using the cluster*

Description

Apply a function to a list using the cluster

Usage

```
clusterApply(cluster, x, fun, ..., stopOnError = FALSE, progressBar = TRUE)
```

Arguments

`cluster`	The cluster of threads to run the function.
`x`	The list on which the function will be applied.
`fun`	The function to apply. Note that the context in which the function is specifies matters (see details).
`...`	Additional parameters for the function.
`stopOnError`	Stop when one of the threads reports an error? If FALSE, all errors will be reported at the end.
`progressBar`	Show a progress bar?

Details

The function will be executed on each element of x in the threads of the cluster. If there are more elements than threads, the elements will be queued. The progress bar will show the number of elements that have been completed. It can sometimes be important to realize that the context in which a function is created is also transmitted to the worker node. If a function is defined inside another function, and that outer function is called with a large argument, that argument will be transmitted to the worker node each time the function is executed. It can therefore make sense to define the function to be called at the package level rather than inside a function, to save overhead.

Value

A list with the result of the function on each item in x.

Examples

```
fun <- function(x) {
  return (x^2)
}

cluster <- makeCluster(numberOfThreads = 3)
clusterApply(cluster, 1:10, fun)
stopCluster(cluster)
```

clusterRequire *Require a package in the cluster*

Description

Calls the `require` function in each node of the cluster.

Usage

```
clusterRequire(cluster, package)
```

Arguments

`cluster`	The cluster object.
`package`	The name of the package to load in all nodes.

createArgFunction *Create an argument function*

Description

Create an argument function

Usage

```
createArgFunction(functionName, excludeArgs = c(), includeArgs = NULL,
  addArgs = list(), rCode = c(), newName)
```

Arguments

`functionName`	The name of the function for which we want to create an args function.
`excludeArgs`	Exclude these arguments from appearing in the args function.
`includeArgs`	Include these arguments in the args function.
`addArgs`	Add these arguments to the args functions. Defined as a list with format name = default.
`rCode`	A character vector representing the R code where the new function should be appended to.
`newName`	The name of the new function. If not specified, the new name will be automatically derived from the old name.

Details

This function can be used to create a function that has (almost) the same interface as the specified function, and the output of this function will be a list of argument values.

Value

A character vector with the R code including the new function.

Examples

```
createArgFunction("read.csv", addArgs = list(exposureId = "exposureId"))
```

---

createConsoleAppender *Create console appender*

Description

Create console appender

Usage

```
createConsoleAppender(layout = layoutSimple)
```

Arguments

layout	The layout to be used by the appender.

Details

Creates an appender that will write to the console.

---

createFileAppender *Create file appender*

Description

Create file appender

Usage

```
createFileAppender(layout = layoutParallel, fileName)
```

Arguments

layout	The layout to be used by the appender.
fileName	The name of the file to write to.

Details

Creates an appender that will write to a file.

createLogger *Create a logger*

Description

Create a logger

Usage

```
createLogger(name = "SIMPLE", threshold = "INFO",
  appenders = list(createConsoleAppender()))
```

Arguments

name	A name for the logger.
threshold	The threshold to be used for reporting.
appenders	A list of one or more appenders as created for example using the createConsoleAppender or createFileAppender function.

Details

Creates a logger that will log messages to its appenders. The logger will only log messages at a level equal to or higher than its threshold. For example, if the threshold is "INFO" then messages marked "INFO" will be logged, but messages marked "TRACE" will not. The order of levels is "TRACE", "DEBUG", "INFO", "WARN", "ERROR, "and FATAL".

Value

An object of type Logger, to be used with the registerLogger function.

excludeFromList *Exclude variables from a list of objects of the same type*

Description

Exclude variables from a list of objects of the same type

Usage

```
excludeFromList(x, exclude)
```

Arguments

x	A list of objects of the same type.
exclude	A character vector of names of variables to exclude.

formatRFile *Format an R file*

Description

Format an R file

Usage

```
formatRFile(file, width.cutoff = 100)
```

Arguments

file	The path to the file.
width.cutoff	Number of characters that each line should be limited to.

formatRFolder *Format all R files in a folder*

Description

Format all R files in a folder

Usage

```
formatRFolder(path = ".", recursive = TRUE, skipAutogenerated = TRUE, ...)
```

Arguments

path	Path to the folder containing the files to format. Only files with the .R extension will be formatted.
recursive	Include all subfolders?
skipAutogenerated	Skip autogenerated files such as RcppExports.R?
...	Parameters to be passed on the the formatRFile function

Examples

```
## Not run:
formatRFolder()

## End(Not run)
```

formatRText *Format R code*

Description

Format R code

Usage

```
formatRText(text, width.cutoff = 100)
```

Arguments

text	A character vector with the R code to be formatted.
width.cutoff	Number of characters that each line should be limited to.

Value

A character vector with formatted R code.

getCohortDefinitionName *Get a cohort definition's name from WebAPI*

Description

Get a cohort definition's name from WebAPI

Usage

```
getCohortDefinitionName(baseUrl, definitionId, formatName = FALSE)
```

Arguments

baseUrl	The base URL for the WebApi instance, for example: "http://api.ohdsi.org:80/WebAPI".
definitionId	The cohort definition id in Atlas.
formatName	Should the name be formatted to remove prefixes and underscores?

Details

Obtains the name of a cohort.

Value

The name of the cohort.

`getCohortGenerationStatuses` *Get Cohort Generation Statuses*

Description

Get Cohort Generation Statuses

Usage

```
getCohortGenerationStatuses(baseUrl, definitionIds, sourceKeys)
```

Arguments

`baseUrl`	The base URL for the WebApi instance, for example: "http://api.ohdsi.org:80/WebAPI".
`definitionIds`	A list of cohort definition Ids
`sourceKeys`	A list of CDM source keys. These can be found in Atlas -> Configure.

Details

Obtains cohort generation statuses for a collection of cohort definition Ids and CDM sources. Useful if running multiple cohort generation jobs that are long-running.

Value

A data frame of cohort generation statuses, start times, and execution durations per definition id and source key.

`getConceptSetConceptIds` *Get Concept Set Concept Ids*

Description

Get Concept Set Concept Ids

Usage

```
getConceptSetConceptIds(baseUrl, setId, vocabSourceKey = NULL)
```

Arguments

`baseUrl`	The base URL for the WebApi instance, for example: "http://api.ohdsi.org:80/WebAPI".
`setId`	The concept set id in Atlas.
`vocabSourceKey`	The source key of the Vocabulary. By default, the priority Vocabulary is used.

Details

Obtains the full list of concept Ids in a concept set.

Value

A list of concept Ids.

`getConceptSetName` *Get a concept set's name from WebAPI*

Description

Get a concept set's name from WebAPI

Usage

```
getConceptSetName(baseUrl, setId, formatName = FALSE)
```

Arguments

`baseUrl`	The base URL for the WebApi instance, for example: "http://api.ohdsi.org:80/WebAPI".
`setId`	The concept set id in Atlas.
`formatName`	Should the name be formatted to remove prefixes and underscores?

Details

Obtains the name of a concept set.

Value

The name of the concept set.

`getLoggers` *Get all registered loggers*

Description

Get all registered loggers

Usage

```
getLoggers()
```

Value

Returns all registerd loggers.

getPriorityVocabKey *Get Priority Vocab Source Key*

Description

Get Priority Vocab Source Key

Usage

```
getPriorityVocabKey(baseUrl)
```

Arguments

baseUrl	The base URL for the WebApi instance, for example: "http://api.ohdsi.org:80/WebAPI".

Details

Obtains the source key of the default OMOP Vocab in Atlas.

Value

A string with the source key of the default OMOP Vocab in Atlas.

insertCohortDefinitionInPackage *Load a cohort definition and insert it into this package*

Description

Load a cohort definition and insert it into this package

Usage

```
insertCohortDefinitionInPackage(definitionId, name = NULL, baseUrl,
  generateStats = FALSE)
```

Arguments

definitionId	The number indicating which cohort definition to fetch.
name	The name that will be used for the json and SQL files. If not provided, the name in cohort will be used, but this may not lead to valid file names.
baseUrl	The base URL for the WebApi instance, for example: "http://api.ohdsi.org:80/WebAPI".
generateStats	Should the SQL include the code for generating inclusion rule statistics? Note that if TRUE, several additional tables are expected to exists as described in the details.

Details

Load a cohort definition from a WebApi instance and insert it into this package. This will fetch the json object and store it in the 'inst/cohorts' folder, and fetch the template SQL and store it in the 'inst/sql/sql_server' folder. Both folders will be created if they don't exist. When using generateStats = TRUE, the following tables are required to exist when executing the SQL: cohort_inclusion, cohort_inclusion_result, cohort_inclusion_stats, and cohort_summary_stats. Also note that the cohort_inclusion table should be populated with the names of the rules prior to executing the cohort definition SQL.

Examples

```
## Not run:
# This will create 'inst/cohorts/Angioedema.json' and 'inst/sql/sql_server/Angioedema.sql':

insertCohortDefinitionInPackage(282, "Angioedema")

## End(Not run)
```

---

insertCohortDefinitionSetInPackage

Insert a set of cohort definitions into package

Description

Insert a set of cohort definitions into package

Usage

```
insertCohortDefinitionSetInPackage(fileName, baseUrl, insertTableSql = TRUE,
  insertCohortCreationR = TRUE, generateStats = FALSE, packageName)
```

Arguments

`fileName`	Name of a CSV file in the inst/settings folder of the package specifying the cohorts to insert. See details for the expected file format.
`baseUrl`	The base URL for the WebApi instance, for example: "http://server.org:80/WebAPI".
`insertTableSql`	Should the SQL for creating the cohort table be inserted into the package as well? This file will be called CreateCohortTable.sql.
`insertCohortCreationR`	Insert R code that will create the cohort table and instantiate the cohorts? This will create a file called R/CreateCohorts.R containing a function called `.createCohorts`.
`generateStats`	Should cohort inclusion rule statistics be created?
`packageName`	The name of the package (only needed when inserting the R code as well).

Details

The CSV file should have at least the following fields:

atlasId The cohort ID in ATLAS.

cohortId The cohort ID that will be used when instantiating the cohort (can be different from atlasId).

name The name to be used for the cohort. This name will be used to generate file names, so please use letters and numbers only (no spaces).

---

insertConceptSetConceptIdsInPackage

Insert a set of concept sets' concept ids into package

Description

Insert a set of concept sets' concept ids into package

Usage

```
insertConceptSetConceptIdsInPackage(fileName, baseUrl)
```

Arguments

fileName	Name of a CSV file in the inst/settings folder of the package specifying the concept sets to insert. See details for the expected file format.
baseUrl	The base URL for the WebApi instance, for example: "http://api.ohdsi.org:80/WebAPI".

Details

The CSV file should have:

atlasId The concept set Id in ATLAS.

---

insertEnvironmentSnapshotInPackage

Store snapshot of the R environment in the package

Description

Store snapshot of the R environment in the package

Usage

```
insertEnvironmentSnapshotInPackage(rootPackage)
```

Arguments

rootPackage	The name of the root package

Details

This function records all versions used in the R environment that are used by one root package, and stores them in the R package that is currently being developed in a file called `inst/settings/rEnvironmentSnapshot.c` can be used for example to restore the environment to the state it was when a particular study package was run using the `restoreEnvironment` function.

Examples

```
## Not run:
insertEnvironmentSnapshotInPackage("OhdsiRTools")

## End(Not run)
```

---

invokeCohortSetGeneration *Invoke the generation of a set of cohort definitions*

Description

Invoke the generation of a set of cohort definitions

Usage

```
invokeCohortSetGeneration(baseUrl, sourceKeys, definitionIds)
```

Arguments

`baseUrl`	The base URL for the WebApi instance, for example: "http://api.ohdsi.org:80/WebAPI".
`sourceKeys`	A list of CDM source keys. These can be found in Atlas -> Configure.
`definitionIds`	A list of cohort definition Ids

Details

Invokes the generation of a set of cohort definitions across a set of CDMs set up in WebAPI. Use `getCohortGenerationStatuses` to check the progress of the set.

---

launchLogViewer *Launch the log viewer Shiny app*

Description

Launch the log viewer Shiny app

Usage

```
launchLogViewer(logFileName)
```

Arguments

logFileName	Name of the log file to view.

Details

Launches a Shiny app that allows the user to view a log file created using the default file logger. Use addDefaultFileLogger to start the default file logger.

---

layoutParallel *Logging layout for parellel computing*

Description

A layout function to be used with an appender. This layout addes the time, thread, level, package name, and function name to the message.

Usage

```
layoutParallel(level, message)
```

Arguments

level	The level of the message (e.g. "INFO")
message	The message to layout.

---

layoutSimple *Simple logging layout*

Description

A layout function to be used with an appender. This layout simply includes the message itself.

Usage

```
layoutSimple(level, message)
```

Arguments

level	The level of the message (e.g. "INFO")
message	The message to layout.

layoutStackTrace *Logging layout with timestamp*

Description

A layout function to be used with an appender. This layout addes the time to the message.

Usage

```
layoutStackTrace(level, message)
```

Arguments

level	The level of the message (e.g. "INFO")
message	The message to layout.

layoutTimestamp *Logging layout with timestamp*

Description

A layout function to be used with an appender. This layout addes the time to the message.

Usage

```
layoutTimestamp(level, message)
```

Arguments

level	The level of the message (e.g. "INFO")
message	The message to layout.

loadSettingsFromJson *Load a settings object from a JSON file*

Description

Load a settings object from a JSON file

Usage

```
loadSettingsFromJson(fileName)
```

Arguments

fileName	Name of the JSON file to load.

Details

Load a settings object from a JSON file, restoring object classes and attributes.

Value

An R object as specified by the JSON.

---

logDebug *Log a message at the DEBUG level*

Description

Log a message at the DEBUG level

Usage

```
logDebug(...)
```

Arguments

...	Zero or more objects which can be coerced to character (and which are pasted together with no separator).

Details

Log a message at the specified level. The message will be sent to all the registered loggers.

---

logError *Log a message at the ERROR level*

Description

Log a message at the ERROR level

Usage

```
logError(...)
```

Arguments

...	Zero or more objects which can be coerced to character (and which are pasted together with no separator).

Details

Log a message at the specified level. The message will be sent to all the registered loggers.

logFatal *Log a message at the FATAL level*

Description

Log a message at the FATAL level

Usage

```
logFatal(...)
```

Arguments

...	Zero or more objects which can be coerced to character (and which are pasted together with no separator).

Details

Log a message at the specified level. The message will be sent to all the registered loggers. This function is be automatically called when an error occurs, and should not be called directly. Use `stop()` instead.

logInfo *Log a message at the INFO level*

Description

Log a message at the INFO level

Usage

```
logInfo(...)
```

Arguments

...	Zero or more objects which can be coerced to character (and which are pasted together with no separator).

Details

Log a message at the specified level. The message will be sent to all the registered loggers.

logTrace *Log a message at the TRACE level*

Description

Log a message at the TRACE level

Usage

```
logTrace(...)
```

Arguments

...	Zero or more objects which can be coerced to character (and which are pasted together with no separator).

Details

Log a message at the specified level. The message will be sent to all the registered loggers.

logWarn *Log a message at the WARN level*

Description

Log a message at the WARN level

Usage

```
logWarn(...)
```

Arguments

...	Zero or more objects which can be coerced to character (and which are pasted together with no separator).

Details

Log a message at the specified level. The message will be sent to all the registered loggers. This function is automatically called when a warning is thrown, and should not be called directly. Use `warning()` instead.

makeCluster *Create a cluster of nodes for parallel computation*

Description

Create a cluster of nodes for parallel computation

Usage

```
makeCluster(numberOfThreads, singleThreadToMain = TRUE,
  divideFfMemory = TRUE, setFfTempDir = TRUE)
```

Arguments

numberOfThreads	Number of parallel threads.
singleThreadToMain	If numberOfThreads is 1, should we fall back to running the process in the main thread?
divideFfMemory	When TRUE, the memory available for processing ff and ffdf objects will be equally divided over the threads.
setFfTempDir	When TRUE, the ffTempDir option will be copied to each thread.

Value

An object representing the cluster.

Examples

```
fun <- function(x) {
  return (x^2)
}

cluster <- makeCluster(numberOfThreads = 3)
clusterApply(cluster, 1:10, fun)
stopCluster(cluster)
```

matchInList *In a list of object of the same type, find those that match the input*

Description

In a list of object of the same type, find those that match the input

Usage

```
matchInList(x, toMatch)
```

Arguments

x	A list of objects of the same type.
toMatch	The object to match.

Details

Typically, toMatch will contain a subset of the variables that are in the objects in the list. Any object matching all variables in `toMatch` will be included in the result.

Value

A list of objects that match the `toMatch` object.

Examples

```
x <- list(a = list(name = "John", age = 25, gender = "M"),
          b = list(name = "Mary", age = 24, gender = "F"))

matchInList(x, list(name = "Mary"))

# [[1]]
# [[1]]$name
# [1] "Mary"
#
# [[1]]$age
# [1] 24
```

OhdsiRTools *OhdsiRTools*

Description

OhdsiRTools

---

registerLogger *Register a logger*

Description

Register a logger

Usage

```
registerLogger(logger)
```

Arguments

logger	An object of type `Logger` as created using the `createLogger` function.

Details

Registers a logger as created using the `createLogger` function to the logging system.

restoreEnvironment *Restore the R environment to a snapshot*

Description

Restore the R environment to a snapshot

Usage

```
restoreEnvironment(snapshot, stopOnWrongRVersion = FALSE)
```

Arguments

snapshot	The snapshot data frame as generated using the takeEnvironmentSnapshot function.
stopOnWrongRVersion	Should the function stop when the wrong version of R is installed? Else just a warning will be thrown when the version doesn't match.

Details

This function restores the R environment to a previous snapshot, meaning all the packages will be restored to the versions they were at at the time of the snapshot. Note: on Windows you will very likely need to have RTools installed to build the various packages.

Examples

```
## Not run:
snapshot <- takeEnvironmentSnapshot("OhdsiRTools")
write.csv(snapshot, "snapshot.csv")

# 5 years later

snapshot <- read.csv("snapshot.csv")
restoreEnvironment(snapshot)

## End(Not run)
```

runAndNotify *Run code and send e-mail notification on error, warning, or completion*

Description

Run code and send e-mail notification on error, warning, or completion

Usage

```
runAndNotify(expression, mailSettings, label = "R", stopOnWarning = FALSE)
```

Arguments

expression	The expression to run.
mailSettings	Arguments to be passed to the send.mail function in the mailR package (except subject and body).
label	A label to be used in the subject to identify a run.
stopOnWarning	Stop expression on warning and send notification?

Value

The ouput of expression.

Examples

```
## Not run:
mailSettings <- list(from = "someone@gmail.com",
                     to = c("someone_else@gmail.com"),
                     smtp = list(host.name = "smtp.gmail.com",
                                 port = 465,
                                 user.name = "someone@gmail.com",
                                 passwd = "super_secret!",
                                 ssl = TRUE),
                     authenticate = TRUE,
                     send = TRUE)
runAndNotify({
  a <- 1 + 2 + 3
}, mailSettings = mailSettings, label = "My fancy R code")

## End(Not run)
```

---

saveSettingsToJson *Save a settings object as JSON file*

Description

Save a settings object as JSON file

Usage

```
saveSettingsToJson(object, fileName)
```

Arguments

object	R object to be saved.
fileName	File name where the object should be saved.

Details

Save a setting object as a JSON file, using pretty formatting and preserving object classes and attributes.

selectFromList *Select variables from a list of objects of the same type*

Description

Select variables from a list of objects of the same type

Usage

```
selectFromList(x, select)
```

Arguments

x	A list of objects of the same type.
select	A character vector of names of variables to select.

Examples

```
x <- list(a = list(name = "John", age = 25, gender = "M"),
          b = list(name = "Mary", age = 24, gender = "F"))
selectFromList(x, c("name", "age"))

# $a
# $a$name
# [1] "John"
#
# $a$age
# [1] 25
#
#
# $b
# $b$name
# [1] "Mary"
#
# $b$age
# [1] 24
```

stopCluster *Stop the cluster*

Description

Stop the cluster

Usage

```
stopCluster(cluster)
```

Arguments

cluster	The cluster to stop

Examples

```
fun <- function(x) {
  return (x^2)
}

cluster <- makeCluster(numberOfThreads = 3)
clusterApply(cluster, 1:10, fun)
stopCluster(cluster)
```

---

takeEnvironmentSnapshot

Take a snapshot of the R environment

Description

Take a snapshot of the R environment

Usage

```
takeEnvironmentSnapshot(rootPackage)
```

Arguments

rootPackage	The name of the root package

Details

This function records all versions used in the R environment that are used by one root package. This can be used for example to restore the environment to the state it was when a particular study package was run using the restoreEnvironment function.

Value

A data frame listing all the dependencies of the root package and their version numbers, in the order in which they should be installed.

Examples

```
snapshot <- takeEnvironmentSnapshot("OhdsiRTools")
snapshot
```

unregisterLogger *Unregister a logger*

Description

Unregister a logger

Usage

```
unregisterLogger(x)
```

Arguments

x	Can either be an integer (e.g. 2 to remove the second logger), the name of the logger, or the logger object itself.

Details

Unregisters a logger from the logging system.

Value

Returns TRUE if the logger was removed.

updateCopyrightYearFile *Update the copyright year in a R or SQL file*

Description

Update the copyright year in a R or SQL file

Usage

```
updateCopyrightYearFile(file)
```

Arguments

file	The path to the file.

updateCopyrightYearFolder *Update the copyright year in all R and SQL files in a folder*

Description

Update the copyright year in all R and SQL files in a folder

Usage

```
updateCopyrightYearFolder(path = ".", recursive = TRUE)
```

Arguments

path	Path to the folder containing the files to update. Only files with the .R and .SQL extension will be updated.
recursive	Include all subfolders?

Examples

```
## Not run:
updateCopyrightYearFolder()

## End(Not run)
```

updatePackageName *Update the package name in a R or SQL file*

Description

Update the package name in a R or SQL file

Usage

```
updatePackageName(file, packageName)
```

Arguments

file	The path to the file.
packageName	The replacement package name

`updatePackageNameFolder` *Update the package name in all R and SQL files in a folder*

Description

Update the package name in all R and SQL files in a folder

Usage

```
updatePackageNameFolder(path = ".", packageName, recursive = TRUE)
```

Arguments

`path`	Path to the folder containing the files to update. Only files with the .R and .SQL extension will be updated.
`packageName`	The replacement package name
`recursive`	Include all subfolders?

Examples

```
## Not run:
updateCopyrightYearFolder()

## End(Not run)
```

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