

Package: kwb.graph (via r-universe)

November 5, 2024

Title Functions Finding Connected Links in Directed Graphs

Version 0.1.0

Description Functions finding connected links in directed graphs.

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URL <https://github.com/KWB-R/kwb.graph>

BugReports <https://github.com/KWB-R/kwb.graph/issues>

Depends R (>= 2.10)

Imports kwb.utils

Suggests igraph, knitr, rmarkdown

VignetteBuilder knitr

Remotes github::kwb-r/kwb.utils

Encoding UTF-8

RoxygenNote 7.1.1

Repository <https://kwb-r.r-universe.dev>

RemoteUrl <https://github.com/KWB-R/kwb.graph>

RemoteRef HEAD

RemoteSha ebc4135dda090918e2fce06b9ddcfdeadc622cdd

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exampleNetwork	<i>Example Network</i>
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Description

Example data describing a network of connected links

Usage

```
exampleNetwork(n_links = 30L, index = 1L)
```

Arguments

n_links	number of links that the network to be returned shall contain. If there is no network with the given number of links, a network that is slightly smaller or bigger is returned. Giving -1L here returns the biggest possible network that is stored in this package.
index	integer number to switch between different sub nets if more than one subset of the required size is available.

Value

data frame with (roughly) n_links observations of two variables. The variables us_node_id (upstream node ID) and ds_node_id (downstream node ID) define the connections between links. They are needed if the list of connected links upstream of each node is to be calculated by means of [getConnectedLinks](#).

getConnectedLinks	<i>Get Connected Links</i>
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Description

Get Connected Links

Usage

```
getConnectedLinks(x, upstream = TRUE, version = 1, dbg = FALSE, ...)
```

Arguments

x	data frame with each row representing a link of the network. Required columns: <i>us_node_id</i> , <i>ds_node_id</i>
upstream	if TRUE (upstream), if FALSE (downstream), default: TRUE
version	1: R-implementation, 2: C-implementation, (default: 1)
dbg	default: FALSE
...	additional arguments passed to getConnectedLinks.C

Value

get connected links

Examples

```

network <- kwb.graph::exampleNetwork(n_links = -1L)

runtime.R <- vector()
runtime.C1 <- vector()
runtime.C2 <- vector()

n <- 1
resultSize <- 2054851
queueSize <- 100*1024

elapsed <- function(exp) system.time(exp)["elapsed"]

for (i in 1:n) {
  cat("run", i, "/", n, "\n")
  runtime.R[i] <- elapsed(x1 <- getConnectedLinks(
    network
  ))
  runtime.C1[i] <- elapsed(x2 <- getConnectedLinks(
    network, version = 2, resultSize = resultSize, queueSize = queueSize
  ))
  runtime.C2[i] <- elapsed(x3 <- getConnectedLinks(
    network, version = 3, resultSize = resultSize, queueSize = queueSize
  ))
}

cat("mean runtime with R-functions:", mean(runtime.R), "\n")
cat("mean runtime with C-functions(1):", mean(runtime.C1), "\n")
cat("mean runtime with C-functions(2):", mean(runtime.C2), "\n")

runtimeData <- data.frame(
  version = 1:3,
  runtime = c(runtime.R), runtime.C1, runtime.C2
)

boxplot(runtime ~ version, data = runtimeData)

```

```
getConnectedLinks.C  #' Get Connected Links (C Implementation)
```

Description

```
#' Get Connected Links (C Implementation)
```

Usage

```
getConnectedLinks.C(  
  directLinks,  
  resultSize = 60000,  
  queueSize = 1024 * 1024,  
  version = 1,  
  dbg = FALSE  
)
```

Arguments

directLinks	directLinks
resultSize	default: 60000
queueSize	default: 1024*1024
version	version of C implementation: 1,2 or 3 (default: 1)
dbg	default: FALSE

Value

get connected links with C implementation

getConnectedLinks.R *Get Connected Links (R Implementation)*

Description

Get Connected Links (R Implementation)

Usage

```
getConnectedLinks.R(directly.connected, dbg = FALSE)
```

Arguments

directly.connected	directly.connected
dbg	default: FALSE

Value

get connected links with R implementation

getDirectLinks.C *Get Direct Links (C Implementation)*

Description

Get Direct Links (C Implementation)

Usage

```
getDirectLinks.C(x, MAX_DIRECT_CONNECTIONS = 5, dbg = FALSE)
```

Arguments

x data frame with each row representing a link of the network. Required columns:
 us_node_id, ds_node_id

MAX_DIRECT_CONNECTIONS
 default: 5

dbg default: FALSE

Value

get direct links with C implementation

getDirectLinks.R *Get Direct Links (R Implementation)*

Description

Get Direct Links (R Implementation)

Usage

```
getDirectLinks.R(x, upstream = TRUE)
```

Arguments

x data frame with each row representing a link of the network. Required columns:
 us_node_id, ds_node_id

upstream if TRUE (upstream), if FALSE (downstream), default: TRUE

Value

get direct links with R implementation

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