

Package ‘biclique’

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Title Maximal Biclique Enumeration in Bipartite Graphs

Version 1.0.5

Encoding UTF-8

Description A tool for enumerating maximal complete bipartite graphs. The input should be a edge list file or a binary matrix file.

The output are maximal complete bipartite graphs. Algorithms used can be found in this paper Y. Lu et al. BMC Res Notes 13, 88 (2020) <doi:10.1186/s13104-020-04955-0>.

URL <https://github.com/YupingLu/biclique>

BugReports <https://github.com/YupingLu/biclique/issues>

Depends R (>= 3.4.0)

Imports graphics, utils

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LazyData true

RoxygenNote 7.0.2

NeedsCompilation yes

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bi.clique	<i>Biclique enumeration</i>
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Description

This function will compute the bicliques and output the statistics of these bicliques. If you want to get bicliques above a threshold, you can change the values of `lleast` and `rleast`. The input file should be tab delimited with number of vertices and edges at the head of the input file. If your input file does not have these values, you can use function `bi.format` to add these values to it. This package supports edgelist and binary matrix file format. Two versions of algorithms are implemented in this function, you can choose either one to get bicliques.

Usage

```
bi.clique(
  filename,
  left_least = 1,
  right_least = 1,
  version = 1,
  filetype = 0,
  getclique = 1,
  envir = .GlobalEnv$.bienv
)
```

Arguments

<code>filename</code>	Input file name
<code>left_least</code>	Least number of left partite <default = 1>
<code>right_least</code>	Least number of right partite <default = 1>
<code>version</code>	Algorithm version <default = 1> [1 2]
<code>filetype</code>	Input file format <default = 0>. 0-edge list, 1-binary matrix.
<code>getclique</code>	Get bicliques <default = 1>. If you set it to 0. you'll only get the statistics without bicliques.
<code>envir</code>	biclique environment

Examples

```
bicliques = bi.clique(system.file("extdata", "example1.el", package = "biclique"))
bicliques = bi.clique(system.file("extdata", "example1.el", package = "biclique"), 3, 2)
bicliques = bi.clique(system.file("extdata", "example4.bmat", package = "biclique"), filetype = 1)
# check a biclique
bicliques$biclique1
```

bi.degree	<i>Get the degree list</i>
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Description

This function will output the degree of each vertex.

Usage

```
bi.degree(filename, filetype = 0)
```

Arguments

filename	Input file name
filetype	Input file format <default = 0>. 0-edge list, 1-binary matrix.

Examples

```
degreelist = bi.degree(system.file("extdata", "example1.el", package = "biclique"))
degreelist = bi.degree(system.file("extdata", "example4.bmat", package = "biclique"), 1)
#get the vertex degree
degreelist['A']
```

bi.format	<i>Add number of vertices and edges to the input file</i>
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Description

This function will calculate the number of vertices and edges and add them to the head of the input file. For edge list file, three entries will be added. And they are: the number of left vertices, the number of right vertices and the number of edges. For binary matrix file, two entries will be added. And they are: the number of left vertices and the number of right vertices. The original input file will be changed. If your input file already have those entries, please don't run this command. Otherwise, you'll get error results after running bi.clique. Please also note that no comment characters are allowed in the input file.

Usage

```
bi.format(filename, filetype = 0)
```

Arguments

filename	Input file name
filetype	Input file format <default = 0>. 0-edge list, 1-binary matrix.

Examples

```
dir <- tempdir()
file.copy(system.file("extdata", "example2.el", package = "biclique"), dir)
file.copy(system.file("extdata", "example5.bmat", package = "biclique"), dir)
bi.format(file.path(dir, "example2.el"))
bi.format(file.path(dir, "example5.bmat"), 1)
```

bi.print *Print the bicliques*

Description

You can pass results from function `bi.clique` to this function to visualize the bicliques.

Usage

```
bi.print(envir = .GlobalEnv$.bienv)
```

Arguments

envir biclique environment

Examples

```
bicliques = bi.clique(system.file("extdata", "example1.el", package = "biclique"))
bi.print()
```

biclique *Maximal Biclique Enumeration in Bipartite Graphs*

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Details

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