

Package ‘maxmatching’

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Type Package

Title Maximum Matching for General Weighted Graph

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Description Computes the maximum matching for unweighted graph and maximum matching for (un)weighted bipartite graph efficiently.

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LazyData TRUE

Imports igraph

RoxygenNote 5.0.1

NeedsCompilation no

Repository CRAN

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blossom	<i>Blossom’s algorithm</i>
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Description

Computes the weighted bipartite matching using Hungarian’s algorithm

Usage

```
blossom(G, weighted = FALSE, maxcardinality = FALSE)
```

Arguments

G	The graph to compute the maximum cardinality matching
weighted	Whether the graph is weighted, if true, weights should be obtained by <code>E(G)\$weight</code>
maxcardinality	Whether the maximum weight should be computed over all maximum cardinality matchings

Details

Blossom's algorithm for maximum cardinality matching for general graph

Efficiently compute the maximum weighted bipartite matching using the Hungarian algorithm

(TODO: citation) Almost a direct port of Joris van Rantwijk's python code at <http://jorisvr.nl/files/graphmatching/20130407/m>

Value

The maximum weighted matching for G, in a list of edges

maxmatching

Maximum Matching

Description

Compute the maximum matching for undirected graph

Usage

```
maxmatching(G, weighted = FALSE, maxcardinality = FALSE)
```

Arguments

G	undirected igraph object representing the input
weighted	whether the graph is weighted, if the graph is weighted, the weight should be able to be accessed with <code>igraph::E(G)\$weight</code>
maxcardinality	Ignore if the graph is bipartite, and unmeaningful if the graph is unweighted. If the graph is non-bipartite and weighted, only computes the maximum weighted matching among all maximum cardinality matchings.

Details

maxmatching

TODO

Value

The matchings in a list

Examples

```
# Unweighted general graph
G1 <- igraph::graph(c(1, 2, 1, 3, 1, 4, 3, 4, 3, 5,
5, 6, 6, 7, 7, 8, 8, 9, 3, 8, 5, 8), directed = FALSE)
maxmatching(G1, weighted = FALSE)
# Unweighted bipartite graph
G2 <- igraph::graph(c(1, 5, 1, 6, 1, 7, 2, 5, 2, 8,
3, 6, 3, 7, 3, 8, 4, 6, 4, 7, 4, 8), directed = FALSE)
maxmatching(G2, weighted = FALSE)
# Weighted bipartite graph
G3 <- igraph::graph(c(1, 5, 1, 6, 1, 7, 2, 5, 2, 8,
3, 6, 3, 7, 3, 8, 4, 6, 4, 7, 4, 8), directed = FALSE)
igraph::E(G3)$weight <- runif(length(igraph::E(G3)), 0, 1)
maxmatching(G3, weighted = TRUE)
```

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