

Classes

DanDirectedGraph

DanDirectedGraphBreadthFirstIterator

The class DanDirectedGraphBreadthFirstIterator implements GraphIterator interface

DanDirectedGraphDepthFirstIterator

The class DanDirectedGraphDepthFirstIterator implements GraphIterator interface

DanUndirectedGraph

The DanUndirectedGraph class handles undirected graphs

DanStack

DanStack is a simple class implementing Stackable interface

Members

ArcType

The directed arc type: incoming or outgoing

ArcType

The class DanDirectedGraph handles directed graphs

Functions

randomIntFromInterval(min, max) ⇒ number

Get a random integer number between min and max (included)

DanDirectedGraph

Kind: global class

- [DanDirectedGraph](#)
 - [new DanDirectedGraph\(\)](#)
 - *instance*
 - [_getCopyOfInnerGraph\(\)](#) ⇒ Map.<I, DanNodeAndDirectedArcs.<I, D>>
 - [_getNodeAndDirectedArcsFromNodeId\(idNode\)](#) ⇒ DanNodeAndDirectedArcs.<I, D> | undefined
 - [.addNode\(node\)](#) ⇒ boolean
 - [.addArcToNodeId\(idNode, arcToAdd, arcType\)](#) ⇒ boolean
 - [.addArcToNode\(node, arcToAdd, arcType\)](#) ⇒ boolean
 - [.removeNode\(idNode\)](#) ⇒ boolean
 - [.isNodeALeaf\(idNode\)](#) ⇒ boolean
 - [_getALeaf\(\)](#) ⇒ DanNode.<I, D> | undefined

- `.toString(showDetails) ⇒ string`
- `.countNodes() ⇒ number`
- `.isEmpty() ⇒ boolean`
- `._getOutgoingNodesList(idNode) ⇒ Array.<DanNode>`
- `._isAcyclic() ⇒ boolean`
- `.isAcyclic() ⇒ boolean`
- `._visitNodes(visitedNodes, nextNode)`
- `.sourceConnectedToAllNodes(idNode) ⇒ boolean`
- `.getDepthFirstIterator(startingNodeId) ⇒ GraphIterator.<DanNode.<I, D>>`
- `.getBreadthFirstIterator(startingNodeId) ⇒ GraphIterator.<DanNode.<I, D>>`
- *static*
 - `.generateConsecutiveNodeGraph(numOfNodes) ⇒ DanDirectedGraph.<number, undefined>`
 - `.generateRandomNodeGraph(numOfNodes) ⇒ DanDirectedGraph.<number, undefined>`

`new DanDirectedGraph()`

the public class constructor

`danDirectedGraph._getCopyOfInnerGraph() ⇒ Map.<I, DanNodeAndDirectedArcs.<I, D>>`

Clone the inner graph structure

Kind: instance method of `DanDirectedGraph`

Returns: `Map.<I, DanNodeAndDirectedArcs.<I, D>>` -

a copy of the inner graph structure

`danDirectedGraph.getNodeAndDirectedArcsFromNodeId(idNode) ⇒ DanNodeAndDirectedArcs.<I, D> | undefined`

Get node and directed arcs structure (as `DanNodeAndDirectedArcs`) from `nodeId`

Kind: instance method of `DanDirectedGraph`

Returns: `DanNodeAndDirectedArcs.<I, D> | undefined` -

node and directed arcs structure or undefined if `nodeId` is not present in the graph

Param	Type	Description
<code>idNode</code>	<code>I</code>	the node identifier

`danDirectedGraph.addNode(node) ⇒ boolean`

Add a node to the graph

Kind: instance method of `DanDirectedGraph`

Returns: `boolean` -

true if the node was correctly added to the graph; false if the node is already present

Param	Type	Description
node	<code>DanNode.<I, D></code>	the node to add

`danDirectedGraph.addArcToNodeId(idNode, arcToAdd, arcType) ⇒ boolean`

Add arc to node given a node id

Kind: instance method of `DanDirectedGraph`

Returns: `boolean` -

true if *arcToAdd* was correctly added to the incoming/outgoing arcs of *idNode*; false if the *idNode* does not exist or if *arcToAdd* was already present

Param	Type	Description
idNode	<code>I</code>	the id of the node receiving <i>arcToAdd</i>
arcToAdd	<code>DanArc.<I, D></code>	the arc being added
arcType	<code>ArcType</code>	<i>arcToAdd</i> will be added among the incoming or outgoing arcs of <i>idNode</i> , based on the value of <i>arcType</i>

`danDirectedGraph.addArcToNode(node, arcToAdd, arcType) ⇒ boolean`

Add arc to node given a node structure

Kind: instance method of `DanDirectedGraph`

Returns: `boolean` -

true if *arcToAdd* was correctly added to the incoming/outgoing arcs of *node*; false if *arcToAdd* was already present

Param	Type	Description
node	<code>DanNode.<I, D></code>	the node receiving <i>arcToAdd</i>
arcToAdd	<code>DanArc.<I, D></code>	the arc being added

Param	Type	Description
arcType	<code>ArcType</code>	<i>arcToAdd</i> will be added among the incoming or outgoing arcs of node, based on the value of arcType

`danDirectedGraph.removeNode(idNode)` ⇒ `boolean`

Remove a node given in input from the graph

Kind: instance method of `DanDirectedGraph`

Returns: `boolean` -

true if the node is correctly removed

Param	Type	Description
idNode	<code>I</code>	the id of the node to remove

`danDirectedGraph.isNodeALeaf(idNode)` ⇒ `boolean`

Check if node is a leaf

Kind: instance method of `DanDirectedGraph`

Returns: `boolean` -

true if the node is a leaf (no outgoing arcs)

Param	Type	Description
idNode	<code>I</code>	the id of the node to check

`danDirectedGraph._getALeaf()` ⇒ `DanNode.<I, D> | undefined`

Get a leaf in the graph or return undefined.

Kind: instance method of `DanDirectedGraph`

Returns: `DanNode.<I, D> | undefined` -

the first leaf found, or undefined if no leaf is found

`danDirectedGraph.toString(showDetails)` ⇒ `string`

The string representation of the directed graph

Kind: instance method of `DanDirectedGraph`

Returns: `string` -

the string representation of the directed graph

Param	Type	Description
showDetails	boolean	if this option is true, all the node and arc details will be included in the output string (default: false)

danDirectedGraph.countNodes() ⇒ number

Public method to retrieve the number of nodes in the graph

Kind: instance method of `DanDirectedGraph`

Returns: number -

the number of nodes in the graph

danDirectedGraph.isEmpty() ⇒ boolean

Check if the graph is empty

Kind: instance method of `DanDirectedGraph`

Returns: boolean -

true if the graph does not contain any node

danDirectedGraph._getOutgoingNodesList(idNode) ⇒ Array.<DanNode>

Get all the outgoing nodes from a node identifier

Kind: instance method of `DanDirectedGraph`

Returns: Array.<DanNode> -

the list of outgoing nodes of idNode as array of DanNode<I, D>

Param	Type	Description
idNode	I	the id of the node to check

danDirectedGraph._isAcyclic() ⇒ boolean

Protected method to check if the graph is acyclic. Remove leaves iteratively from the graph: stop if the graph gets empty (acyclic graph), or if there are no more leaves to remove (cyclic graph).

Kind: instance method of `DanDirectedGraph`

Returns: boolean -

true if the graph does not contain cycles, otherwise false

`danDirectedGraph.isAcyclic()` ⇒ **boolean**

Public method to check if the graph is acyclic. First we keep a copy of the current inner graph. Then we invoke the protected `[this._isAcyclic](#DanDirectedGraph<I, D>+_isAcyclic)` method to check if the graph is acyclic. Then we restore the inner state (memento pattern).

Kind: instance method of **DanDirectedGraph**

Returns: **boolean** -

true if the graph does not contain cycles

`danDirectedGraph._visitNodes(visitedNodes, nextNode)`

Protected method to visit all the neighbours of a node, given in input the node id and a previous set of visitedNodes

Kind: instance method of **DanDirectedGraph**

Param	Type	Description
visitedNodes	Set.<I>	the nodes already visited
nextNode	I	the next node to visit

`danDirectedGraph.sourceConnectedToAllNodes(idNode)` ⇒ **boolean**

Public method to check if all nodes are connected to the source node in input

Kind: instance method of **DanDirectedGraph**

Returns: **boolean** -

true if source can reach all of the nodes in the graph

Param	Type	Description
idNode	I	source node to be checked

`danDirectedGraph.getDepthFirstIterator(startingNodeid)` ⇒ **GraphIterator.<DanNode.<I, D>>**

Get depth-first iterator

Kind: instance method of `DanDirectedGraph`

Returns: `GraphIterator.<DanNode.<I, D>>` -

the depth-first iterator

Param	Type	Description
startingNodeId	<code>I</code>	the starting node identifier for the iterator

`danDirectedGraph.getBreadthFirstIterator(startingNodeId) ⇒ GraphIterator.<DanNode.<I, D>>`

Get breadth-first iterator

Kind: instance method of `DanDirectedGraph`

Returns: `GraphIterator.<DanNode.<I, D>>` -

the breadth-first iterator

Param	Type	Description
startingNodeId	<code>I</code>	the starting node identifier for the iterator

`DanDirectedGraph.generateConsecutiveNodeGraph(numOfNodes) ⇒ DanDirectedGraph.<number, undefined>`

A utility public static method to generate a directed graph with a number of *numOfNodes* consecutive nodes

Kind: static method of `DanDirectedGraph`

Returns: `DanDirectedGraph.<number, undefined>` -

a directed graph with *numOfNodes* nodes

Param	Type	Description
numOfNodes	<code>number</code>	the number of nodes of the output graph

`DanDirectedGraph.generateRandomNodeGraph(numOfNodes) ⇒ DanDirectedGraph.<number, undefined>`

A utility public static method to generate a directed graph with a number of *numOfNodes* random nodes

Kind: static method of `DanDirectedGraph`

Returns: `DanDirectedGraph.<number, undefined>` -

a directed graph with *numOfNodes* nodes

Param	Type	Description
-------	------	-------------

Param	Type	Description
numOfNodes	number	the number of nodes of the output graph

DanDirectedGraphBreadthFirstIterator

The class `DanDirectedGraphBreadthFirstIterator` implements `GraphIterator` interface

Kind: global class

- `DanDirectedGraphBreadthFirstIterator`
 - `new DanDirectedGraphBreadthFirstIterator(collection, startingNodeId)`
 - `._getNodeAndDirectedArcsFromNodeId(nodeId) ⇒ DanNodeAndDirectedArcs.<I, D>`
 - `._initFields(startingNodeId)`
 - `.current() ⇒ DanNode.<I, D> | undefined`
 - `.next() ⇒ DanNode.<I, D> | undefined`
 - `._addNextNodeOutgoingsToNextLevelQueueIfNotAlreadyVisitedOrQueued() ⇒ boolean`
 - `._advance()`
 - `.hasNext() ⇒ boolean`
 - `.rewind()`

`new DanDirectedGraphBreadthFirstIterator(collection, startingNodeId)`

The public class constructor

Throws:

- `Error`
exception if `startingNodeId` was not found in graph

Param	Type	Description
collection	<code>DanDirectedGraph.<I, D></code>	the directed graph
startingNodeId	<code>I</code>	the starting node identifier

`danDirectedGraphBreadthFirstIterator._getNodeAndDirectedArcsFromNodeId(nodeId) ⇒ DanNodeAndDirectedArcs.<I, D>`

Retrieve node and directed arcs structure from node identifier

Kind: instance method of `DanDirectedGraphBreadthFirstIterator`

Returns: `DanNodeAndDirectedArcs.<I, D>` -

the node and directed arcs structure `DanNodeAndDirectedArcs`

Throws:

- **Error**

exception if nodeId was not found in graph

Param	Type	Description
nodeId	I	the node identifier

`danDirectedGraphBreadthFirstIterator._initFields(startingNodeId)`

Init the class fields with the starting node identifier passed in input

Kind: instance method of **DanDirectedGraphBreadthFirstIterator**

Throws:

- **Error**

exception if startingNodeId was not found in graph

Param	Type	Description
startingNodeId	I	the starting node identifier

`danDirectedGraphBreadthFirstIterator.current() ⇒ DanNode.<I, D> | undefined`

Get the current node, or return undefined if iterator was not yet started

Kind: instance method of **DanDirectedGraphBreadthFirstIterator**

Throws:

- **Error**

exception if this._currentNodeId was not found in graph

`danDirectedGraphBreadthFirstIterator.next() ⇒ DanNode.<I, D> | undefined`

Get the next node, or return undefined if the iterator's end was reached

Kind: instance method of **DanDirectedGraphBreadthFirstIterator**

Throws:

- **Error**

exception if this._nextNodeId was not found in graph

`danDirectedGraphBreadthFirstIterator._addNextNodeOutgoingsToNextLevelQueueIfNotAlreadyVisitedOrQueued() ⇒ boolean`

Add the outgoing nodes of this._nextNodeId to the next-level-queue, if the node was not already visited, and if it's not already present inside the queue

Kind: instance method of `DanDirectedGraphBreadthFirstIterator`

Returns: `boolean` -

true if this._nextNodeId is not null, otherwise false

Throws:

- `Error`
exception if this._nextNodeId was not found in graph

`danDirectedGraphBreadthFirstIterator._advance()`

Advance to the next node in a breadth first fashion

Kind: instance method of `DanDirectedGraphBreadthFirstIterator`

`danDirectedGraphBreadthFirstIterator.hasNext() ⇒ boolean`

Check if the iterator can step to a next node

Kind: instance method of `DanDirectedGraphBreadthFirstIterator`

Returns: `boolean` -

true if the iterator can step to a next node, false if there are no more nodes left to visit in the iterator

`danDirectedGraphBreadthFirstIterator.rewind()`

Restart the iterator

Kind: instance method of `DanDirectedGraphBreadthFirstIterator`

DanDirectedGraphDepthFirstIterator

The class `DanDirectedGraphDepthFirstIterator` implements `GraphIterator` interface

Kind: global class

- `DanDirectedGraphDepthFirstIterator`
 - `new DanDirectedGraphDepthFirstIterator(collection, startingNodeId)`
 - `._getNodeAndDirectedArcsFromNodeId(nodeId) ⇒ DanNodeAndDirectedArcs.<I, D>`
 - `._initFields(startingNodeId)`
 - `.current() ⇒ DanNode.<I, D> | undefined`
 - `.next() ⇒ DanNode.<I, D> | undefined`
 - `._advance()`
 - `.hasNext() ⇒ boolean`
 - `.rewind()`

`new DanDirectedGraphDepthFirstIterator(collection, startingNodeId)`

The public class constructor

Throws:

- `Error`
exception if startingNodeId was not found in graph

Param	Type	Description
collection	<code>DanDirectedGraph.<I, D></code>	the directed graph
startingNodeId	<code>I</code>	the starting node identifier

`danDirectedGraphDepthFirstIterator._getNodeAndDirectedArcsFromNodeId(nodeId) ⇒ DanNodeAndDirectedArcs.<I, D>`

Retrieve node and directed arcs structure from node identifier

Kind: instance method of `DanDirectedGraphDepthFirstIterator`

Returns: `DanNodeAndDirectedArcs.<I, D>` -

the node and directed arcs structure `DanNodeAndDirectedArcs`

Throws:

- `Error`
exception if nodeId was not found in graph

Param	Type	Description
nodeId	<code>I</code>	the node identifier

`danDirectedGraphDepthFirstIterator._initFields(startingNodeId)`

Init the class fields with the starting node identifier passed in input

Kind: instance method of `DanDirectedGraphDepthFirstIterator`

Throws:

- `Error`
exception if startingNodeId was not found in graph

Param	Type	Description
-------	------	-------------

Param	Type	Description
startingNodeId	I	the starting node identifier

`danDirectedGraphDepthFirstIterator.current() ⇒ DanNode.<I, D> | undefined`

Get the current node, or return undefined if iterator was not yet started

Kind: instance method of `DanDirectedGraphDepthFirstIterator`

Throws:

- `Error`
exception if this._currentNodeId was not found in graph

`danDirectedGraphDepthFirstIterator.next() ⇒ DanNode.<I, D> | undefined`

Get the next node, or return undefined if the iterator's end was reached

Kind: instance method of `DanDirectedGraphDepthFirstIterator`

Throws:

- `Error`
exception if this._nextNodeId was not found in graph

`danDirectedGraphDepthFirstIterator._advance()`

Advance to the next node in a depth first fashion

Kind: instance method of `DanDirectedGraphDepthFirstIterator`

`danDirectedGraphDepthFirstIterator.hasNext() ⇒ boolean`

Check if the iterator can step to a next node

Kind: instance method of `DanDirectedGraphDepthFirstIterator`

Returns: `boolean` -

true if the iterator can step to a next node, false if there are no more nodes left to visit in the iterator

`danDirectedGraphDepthFirstIterator.rewind()`

Restart the iterator

Kind: instance method of `DanDirectedGraphDepthFirstIterator`

DanUndirectedGraph

The `DanUndirectedGraph` class handles undirected graphs

Kind: global class

- `DanUndirectedGraph`
 - `new DanUndirectedGraph()`
 - *instance*
 - `.addNode(node) ⇒ boolean`
 - `.addArcToNodeId(idNode, arcToAdd) ⇒ boolean`
 - `.addArcToNode(node, nodeToAdd) ⇒ boolean`
 - `.removeNode(idNode) ⇒ boolean`
 - `._getAdjacentNodesList(idNode) ⇒ Array.<DanNode>`
 - `._getANode() ⇒ DanNode.<I, D> | undefined`
 - `._visitNodes(visitedNodes, nextNode)`
 - `._checkForCycle(visitedNodes, nextNode, fromNode) ⇒ boolean`
 - `.isConnected() ⇒ boolean`
 - `.isAcyclic() ⇒ boolean`
 - `.countNodes() ⇒ number`
 - `.isEmpty() ⇒ boolean`
 - `.toString(showDetails) ⇒ string`
 - `.getInnerGraph() ⇒ Map.<I, DanNodeAndUndirectedArcs.<I, D>>`
 - *static*
 - `.generateConsecutiveNodeGraph(numOfNodes) ⇒ DanUndirectedGraph.<number, undefined>`
 - `.generateRandomNodeGraph(numOfNodes) ⇒ DanUndirectedGraph.<number, undefined>`

`new DanUndirectedGraph()`

the public class constructor

`danUndirectedGraph.addNode(node) ⇒ boolean`

Add a node to the graph

Kind: instance method of `DanUndirectedGraph`

Returns: `boolean` -

true if the node was correctly added to the graph; false if the node is already present

Param	Type	Description
node	<code>DanNode.<I, D></code>	the node to add

`danUndirectedGraph.addArcToNodeId(idNode, arcToAdd) ⇒ boolean`

Add an arc to a node, given the node identifier

Kind: instance method of `DanUndirectedGraph`

Returns: `boolean` -

true if *arcToAdd* was correctly added to the adjacent arcs of *idNode*; false if the *idNode* does not exist or if *arcToAdd* was already present

Param	Type	Description
<i>idNode</i>	I	the id of the node receiving <i>arcToAdd</i>
<i>arcToAdd</i>	DanArc.<I, D>	the arc being added

danUndirectedGraph.addArcToNode(node, nodeToAdd) ⇒ boolean

Add arc to node, given the node interface structure

Kind: instance method of **DanUndirectedGraph**

Returns: **boolean** -

true if *arcToAdd* was correctly added to the adjacent arcs of node; false if *arcToAdd* was already present

Param	Type	Description
<i>node</i>	DanNode.<I, D>	the node receiving <i>arcToAdd</i>
<i>nodeToAdd</i>	DanArc.<I, D>	the node being added

danUndirectedGraph.removeNode(idNode) ⇒ boolean

Remove the node given in input from the graph

Kind: instance method of **DanUndirectedGraph**

Returns: **boolean** -

true if the node is correctly removed

Param	Type	Description
<i>idNode</i>	I	the id of the node to remove

danUndirectedGraph._getAdjacentNodesList(idNode) ⇒ Array.<DanNode>

Get the list of adjacent nodes of a given node identifier

Kind: instance method of **DanUndirectedGraph**

Returns: **Array.<DanNode>** -

the list of adjacent nodes of *idNode* as array of **DanNode<I, D>**

Param	Type	Description
idNode	I	the id of the node to check

danUndirectedGraph._getNode() ⇒ **DanNode.<I, D> | undefined**

Get a node in the graph

Kind: instance method of **DanUndirectedGraph**

Returns: **DanNode.<I, D> | undefined** -

a node in the graph or undefined if the graph is empty

danUndirectedGraph._visitNodes(visitedNodes, nextNode)

Protected method to visit all the neighbours of a node, given in input the node id and a previous set of visitedNodes

Kind: instance method of **DanUndirectedGraph**

Param	Type	Description
visitedNodes	Set.<I>	the nodes already visited
nextNode	I	the next node to visit

danUndirectedGraph._checkForCycle(visitedNodes, nextNode, fromNode) ⇒ **boolean**

Recursively checks for the presence of a cycle starting from node id nextNode

Kind: instance method of **DanUndirectedGraph**

Returns: **boolean** -

true if a cycle is found, false if no cycle is found

Param	Type	Description
visitedNodes	Set.<I>	the nodes already visited
nextNode	I	the next node to visit
fromNode	I undefined	the parent node (default: undefined)

`danUndirectedGraph.isConnected()` ⇒ **boolean**

Check if the graph is connected

Kind: instance method of `DanUndirectedGraph`

Returns: **boolean** -

true if the graph is connected

`danUndirectedGraph.isAcyclic()` ⇒ **boolean**

Public method to check if the graph is acyclic

Kind: instance method of `DanUndirectedGraph`

Returns: **boolean** -

true if the graph does not contain cycles

`danUndirectedGraph.countNodes()` ⇒ **number**

Public method to retrieve the number of nodes in the graph

Kind: instance method of `DanUndirectedGraph`

Returns: **number** -

the number of nodes in the graph

`danUndirectedGraph.isEmpty()` ⇒ **boolean**

Check if the graph is empty

Kind: instance method of `DanUndirectedGraph`

Returns: **boolean** -

true if the graph does not contain any node

`danUndirectedGraph.toString(showDetails)` ⇒ **string**

The string representation of the undirected graph

Kind: instance method of `DanUndirectedGraph`

Returns: **string** -

the string representation of the undirected graph

Param	Type	Description
-------	------	-------------

Param	Type	Description
showDetails	boolean	if this option is true, all the node and arc details will be included in the output string (default: false)

`danUndirectedGraph.getInnerGraph() ⇒ Map.<I, DanNodeAndUndirectedArcs.<I, D>>`

Get the inner graph object

Kind: instance method of `DanUndirectedGraph`

Returns: `Map.<I, DanNodeAndUndirectedArcs.<I, D>>` -

the inner graph Map object

`DanUndirectedGraph.generateConsecutiveNodeGraph(numOfNodes) ⇒ DanUndirectedGraph.<number, undefined>`

A utility public static method to generate an undirected graph with a number of *numOfNodes* consecutive nodes

Kind: static method of `DanUndirectedGraph`

Returns: `DanUndirectedGraph.<number, undefined>` -

an undirected graph with *numOfNodes* nodes

Param	Type	Description
numOfNodes	number	the number of nodes of the output graph

`DanUndirectedGraph.generateRandomNodeGraph(numOfNodes) ⇒ DanUndirectedGraph.<number, undefined>`

A utility public static method to generate an undirected graph with a number of *numOfNodes* random nodes

Kind: static method of `DanUndirectedGraph`

Returns: `DanUndirectedGraph.<number, undefined>` -

an undirected graph with *numOfNodes* nodes

Param	Type	Description
numOfNodes	number	the number of nodes of the output graph

DanStack

DanStack is a simple class implementing Stackable interface

Kind: global class

- [DanStack](#)
 - [new DanStack\(\)](#)
 - [.push\(val\)](#)
 - [.pop\(\) ⇒ T | undefined](#)
 - [.peek\(\) ⇒ T | undefined](#)
 - [.isEmpty\(\) ⇒ boolean](#)
 - [.clear\(\)](#)

[new DanStack\(\)](#)

The public class constructor

[danStack.push\(val\)](#)

Insert a value to the top of the stack We use the 'push' method of the private member '_list'

Kind: instance method of [DanStack](#)

Param	Type	Description
val	T	the value to be pushed inside the stack

[danStack.pop\(\) ⇒ T | undefined](#)

Get the value from the top of the stack and remove it from the stack itself We use the 'pop' method of the private member '_list'

Kind: instance method of [DanStack](#)

Returns: [T | undefined](#) -

the element on top of the stack if the stack is not empty; conversely it returns undefined

[danStack.peek\(\) ⇒ T | undefined](#)

Get the value from the top of the stack but do not remove it from the stack itself

Kind: instance method of [DanStack](#)

Returns: [T | undefined](#) -

the element on top of the stack if the stack is not empty; conversely it returns undefined

[danStack.isEmpty\(\) ⇒ boolean](#)

Check if the stack is empty We use the 'length' method of the private member '_list' to check the number of elements present: if the number is less than 1, the stack is empty

Kind: instance method of `DanStack`

Returns: `boolean` -

true if the stack is empty; it returns false is the stack is not empty

`danStack.clear()`

Clear all stack's elements We use the 'splice' method of the private member '_list'

Kind: instance method of `DanStack`

ArcType

The directed arc type: incoming or outgoing

Kind: global variable

ArcType

The class `DanDirectedGraph` handles directed graphs

Kind: global variable

`randomIntFromInterval(min, max) ⇒ number`

Get a random integer number between min and max (included)

Kind: global function

Returns: `number` -

an integer between min and max (included)

Param	Type	Description
min	<code>number</code>	minimum number
max	<code>number</code>	maximum number