

Types of attributes and methods of the class TransactionAnalyzer

Notation

- I denotes the number of items.
- C denotes the number of separate categories associated with the items.
- V_c denotes the number of separate values in the category c .
- N denotes the number of nodes.
- P denotes the number of patterns.
- Y denotes the number of years for which transactions exist.
- J denotes the number of itemsets.
- $+$ denotes public attributes and methods (i.e., exported attributes and methods).
- $-$ denotes private attributes and methods (i.e., non-exported attributes and methods).

Class attributes

- ***STATUS_PERSISTENT***: character
- ***STATUS_DECLINING***: character
- ***STATUS_EMERGENT***: character
- ***STATUS_LATENT***: character

- ***TRANSACTIONS***: character
- ***NODES***: character
- ***PATTERNS***: character
- ***RULES***: character

- ***NODES_OR_PATTERNS***: character
- ***NODES_PATTERNS_OR_RULES***: character
- ***NODES_PATTERNS_OR_TRANSACTIONS***: character
- ***ANY_ITEMSETS***: character

- ***NODE_LINKS***: character
- ***PATTERN_LINKS***: character

Attributes

- + **transactions**: TransactionSet
- + **items**: named vector(character) or named vector(numeric)
- + **items_categories**: data.frame

	category 1	category 2	...	category C
item 1	factor	factor	...	factor
item 2	factor	factor	...	factor
...
item I	factor	factor	...	factor

- + **categories_colors**: list(named vector(character))

\$category1

value 1	character
value 2	character
...	...
value V_1	character

\$category2

value 1	character
value 2	character
...	...
value V_2	character

...

\$categoryC

value 1	character
value 2	character
...	...
value V_C	character

- + **status_colors**: vector(character)
- + **parameters**: list(**target**: character,
 min_frequency: integer,
 min_length: integer,
 max_length: numeric,
 status_limit: numeric)

- + **nodes**: data.frame

node	length	frequency
vector(character)	integer	integer

- + **nodes_per_year**: matrix

	year 1	year 2	...	year Y
node 1	integer	integer	...	integer
node 2	integer	integer	...	integer
...
node N	integer	integer	...	integer

- + **n_links**: matrix

	node 1	node 2	...	node N
node 1	integer	integer	...	integer
node 2	integer	integer	...	integer
...
node N	integer	integer	...	integer

+ **node_links**: data.frame

endpoint.1	endpoint.2	items	weight
integer	integer	character	integer

+ **nodes_patterns**: matrix

	pattern 1	pattern 2	...	pattern P
node 1	logical	logical	...	logical
node 2	logical	logical	...	logical
...
node N	logical	logical	...	logical

+ **patterns**: data.frame

pattern	year	length	support	frequency	weight	specificity	status
vector(character)	integer	integer	numeric	integer	integer	numeric	character

+ **patterns_per_year**: matrix

	year 1	year 2	...	year Y
pattern 1	integer	integer	...	integer
pattern 2	integer	integer	...	integer
...
pattern P	integer	integer	...	integer

+ **p_links**: matrix

	pattern 1	pattern 2	...	pattern P
pattern 1	integer	integer	...	integer
pattern 2	integer	integer	...	integer
...
pattern P	integer	integer	...	integer

+ **pattern_links**: data.frame

endpoint.1	endpoint.2	items	weight	year
integer	integer	character	integer	integer

Constructor

+ **transaction.analyzer**(**transactions**: TransactionSet, **items**: see data.frame below,

target: character, **min_frequency**: numeric, **min_length**: numeric,

max_length: numeric, **status_limit**: numeric, **init**: logical, **verbose**: logical):

TransactionAnalyzer

item	name	category 1	category 2	...	category C
character	character	factor	factor	...	factor

Methods

- + **reset(object: TransactionAnalyzer, from: numeric, verbose: logical)**
- + **init(part: character, verbose: logical):** itemsets (class object from arules package) or NULL
- **init_nodes(verbose: logical)**
- **init_node_links(verbose: logical)**
- **init_patterns(verbose: logical):** itemsets (class object from arules package) or NULL
- **init_pattern_links(verbose: logical)**
- + **is_init(part: character):** logical or vector(logical)
- **is_init_nodes():** logical
- **is_init_node_links():** logical
- **is_init_patterns():** logical
- **is_init_pattern_links():** logical
- **check_init(part: character or vector(character), stop: logical, prefix: character, suffix: character):**
logical or vector(logical)
- **list_trx_per_year():** see attribute **nodes_per_year**
- **list_separate_trx():** see attribute **nodes**
- **count_links(entities: character):** see attributes **n_links** and **p_links**
- **search_links(entities: character):** see attributes **node_links** and **pattern_links**
- **list_separate_patterns(target: character, min_frequency: numeric, min_length: numeric, max_length: numeric, arules: logical):** itemsets (class object from arules package) or data.frame

pattern	support	frequency
vector(character)	numeric	integer

- **list_patterns_by_trx():** see attribute **nodes_patterns**
 - **list_patterns_per_year():** see attribute **patterns_per_year**
 - **compute_patterns_characteristics():** see attribute **patterns**
 - **compute_specificity(patterns: list(vector(character)), frequencies: vector(numeric), weights: vector(numeric)):** vector(numeric)
 - **check_RI_params(end: numeric, period: numeric):** vector(integer)
- | end | period |
|---------|---------|
| integer | integer |
- **compute_reporting_indexes(patterns: list(vector(character)), end: numeric, period: numeric):**
vector(numeric)

- **compute_reporting_indexes_limits**(**patterns**: list(vector(character)), **end**: numeric, **overall_period**: numeric, **recent_period**: numeric): matrix

RI.overall	RI.recent
numeric	numeric

- **compute_xi_threshold**(**reporting_indexes**: vector(numeric)): integer
- **compute_ri_threshold**(**reporting_indexes**: vector(numeric), **xi**: numeric): numeric
- + **dynamic_status**(**patterns**: list(vector(character)), **end**: numeric, **overall_period**: numeric, **recent_period**: numeric): list

[["res"]]: data.frame

RI.overall	is.above.threshold.1	RI.recent	is.above.threshold.2	status
numeric	logical	numeric	logical	character

[["thresholds"]]: matrix

	threshold.1	threshold.2
xi	numeric	numeric
RI	numeric	numeric

- + **spectrum_chart**(**pc**: character or see attribute **patterns**, **identifiers**: character, **sort**: logical, **title**: character, **path**: character, **name**: character): data.frame

ID	pattern	year	length	support	frequency	f.complex	f.simple	weight	specificity	status
integer	vector	integer	integer	numeric	integer	integer	integer	integer	numeric	character

- **plot_spectrum_chart**(**pc**: see attribute **patterns**, **frequencies**: see method **frequency_by_node_complexity**, **title**: character)

- **pattern_node_characteristics**(**patterns**: list(vector(character))): list

[["frequencies"]]:

1	vector(integer)
2	vector(integer)
...	...
P	vector(integer)

[["lengths"]]:

1	vector(integer)
2	vector(integer)
...	...
P	vector(integer)

- + **frequency_by_complexity**(**patterns**: list(vector(character))): matrix

complex	simple
integer	integer

+ **spectrosome_chart**(**nopc**: character or see attribute **nodes** or **patterns**, **identifiers**: character, **nb_graphs**: numeric, **min_link_weight**: numeric, **vertex_size**: character or numeric or vector(numeric), **size_range**: vector(numeric), **vertex_col**: character or vector(character), **clusters**: numeric, **highlight**: numeric, **use_names**: logical, **n.cutoff**: numeric, **c.cutoff**: numeric, **display_mixt**: logical, **title**: character, **path**: character, **name**: character, ...): list

[["vertices"]]: data.frame

ID	node	length	frequency	degree
integer	vector(character)	integer	integer	integer

or (depends on the type of entities contained in **nopc**)

ID	pattern	year	length	support	frequency	weight	specificity	status	degree
integer	vector(character)	integer	integer	numeric	integer	integer	numeric	character	integer

[["edges"]]: data.frame

ID	endpoint.1	endpoint.2	items	weight
integer	integer	integer	character	integer

or (depends on the type of entities contained in **nopc**)

ID	endpoint.1	endpoint.2	items	weight	year
integer	integer	integer	character	integer	integer

[["coords"]]: list(matrix)

	x	y
vertex 1	numeric	numeric
vertex 2	numeric	numeric
...
vertex <i>N</i> or <i>P</i>	numeric	numeric

– **cluster_text**(**graph**: see matrix below, **links**: see attributes **node_links** and **pattern_links**, **display**: numeric, **highlight**: numeric, **use_names**: logical, **cutoff**: numeric)

	x	y
vertex 1	numeric	numeric
vertex 2	numeric	numeric
...
vertex <i>N</i> or <i>P</i>	numeric	numeric

+ **network_density**(**links**: see attribute **node_links** or **pattern_links**): numeric

+ **degree**(**ID**: numeric, **links**: see attribute **node_links** or **pattern_links**): integer

+ **itemset_chart**(**tnpc**: character or TransactionSet or see attribute **nodes** or **patterns**,
identifiers: character, **length_one**: logical, **jitter**: logical, **under**: character,
over: character, **use_names**: logical, **n.cutoff**: numeric,
category: character or numeric, **c.cutoff**: numeric, **sort_by**: character,
title: character, **path**: character, **name**: character): TransactionSet or data.frame

ID	node	length	frequency
integer	vector(character)	integer	integer

or (depends on the type of entities contained in **nopc**)

ID	pattern	year	length	support	frequency	weight	specificity	status
integer	vector(character)	integer	integer	numeric	integer	integer	numeric	character

+ **category_tree_chart**(**category**: character or numeric, **items**: see attribute **items**,
use_names: logical, **n.cutoff**: numeric, **c.cutoff**: numeric,
vertex_size: numeric, **vertex_alpha**: numeric, **leaf_size**: numeric,
leaf_alpha: numeric, **leaf_margin**: numeric, **label_size**: numeric,
label_margin: numeric): ggplot2 graph

+ **co_occurrence_chart**(**items**: see attribute **items**, **category**: character or numeric,
co_occ: matrix(numeric), **proportions**: logical, **min_occ**: numeric,
max_occ: numeric, **use_names**: logical, **n.cutoff**: numeric, **c.cutoff**: numeric,
sort_by: character, **vertex_size**: numeric, **vertex_alpha**: numeric,
vertex_margin: numeric, **label_size**: numeric, **label_margin**: numeric,
edge_looseness: numeric, **edge_alpha**: numeric, **palette**: character or
numeric, **palette_direction**: numeric): ggplot2 graph

+ **extract_rules**(**itemsets**: character or list, **pruning**: logical, **arules**: logical, **as_sets**: logical, ...): rules
(class object from arules package) or data.frame

antecedent		consequent	support	confidence	lift	frequency
vector(character)	=>	character	numeric	numeric	numeric	integer

or (**antecedent** and **consequent** types depend on the value of **as_sets**. Presence of **frequency** or **itemset** depends on the value of **itemsets**)

antecedent		consequent	support	confidence	lift	itemset
factor	=>	factor	numeric	numeric	numeric	integer

+ **rules_chart**(**rules**: see method **extract_rules**, **items**: see attribute **items**, **parameter**: list,
display: character, **threshold**: numeric, **direction**: logical, **use_names**: logical,
n.cutoff: numeric, **category**: character or numeric, **c.cutoff**: numeric,
sort_by: character, **vertex_size**: numeric, **vertex_alpha**: numeric,
vertex_margin: numeric, **label_size**: numeric, **label_margin**: numeric,
edge_looseness: numeric, **edge_alpha**: numeric, **palette**: character,
palette_direction: numeric, **plot**: logical): list

[["graph"]]: ggplot2 graph

[["rules"]]: see method **extract_rules**

- + **export(nporc**: see attribute **nodes** or **patterns** or return of function **extract_rules**, ...)

- + **get_trx_from_category**(**trx**: character or TransactionSet, **category**: character or numeric, **value**: character, **as_indices**: logical): TransactionSet or named vector(integer)

- + **get_nodes**(**nc**: character or see attribute **nodes**, **element**: character or numeric, **value**: numeric or vector(numeric) or character or vector(character), **condition**: character): see attribute **nodes**
- **get_nodes_from_items**(**nc**: character or see attribute **nodes**, **items**: vector(numeric), **condition**: character): see attribute **nodes**
- **get_nodes_from_characteristic**(**nc**: character or see attribute **nodes**, **characteristic**: character, **value**: numeric, **condition**: character): see attribute **nodes**
- **get_nodes_from_category**(**nc**: character or see attribute **nodes**, **category**: character or numeric, **value**: character, **condition**: character): see attribute **nodes**

- + **get_patterns**(**pc**: character or see attribute **patterns**, **element**: character or numeric, **value**: numeric or vector(numeric) or character or vector(character), **condition**: character): see attribute **patterns**
- **get_patterns_from_items**(**pc**: character or see attribute **patterns**, **items**: vector(numeric), **condition**: character): see attribute **patterns**
- **get_patterns_from_characteristic**(**pc**: character or see attribute **patterns**, **characteristic**: character, **value**: numeric, **condition**: character): see attribute **patterns**
- **get_patterns_from_status**(**pc**: character or see attribute **patterns**, **value**: vector(character), **condition**: character): see attribute **patterns**
- **get_patterns_from_category**(**pc**: character or see attribute **patterns**, **category**: character or numeric, **value**: character, **condition**: character): see attribute **patterns**

- + **get_links**(**nopc**: character or see attribute **nodes** or **patterns**): see attribute **node_links** or **pattern_links**
- + **get_isolates**(**nopc**: character or see attribute **nodes** or **patterns**): see attribute **nodes** or **patterns**
- + **get_non_isolates**(**nopc**: character or see attribute **nodes** or **patterns**): see attribute **nodes** or **patterns**
- + **get_complexes**(**nopc**: character or see attribute **nodes** or **patterns**, **category**: character or numeric, **condition**: character, **min_nb_values**: numeric): see attribute **nodes** or **patterns**

- + **get_item_names**(**items**: vector(character) or vector(numeric) according to the attribute **items**): vector(character)

+ **get_item_colors(category: character or numeric,**
items: vector(character) or vector(numeric) according to the attribute items):
vector(character)

+ **category_values(itemsets: list(vector(character)), as_character: logical, unique: logical):**

list(list(factor))

\$category1

itemset 1	factor
itemset 2	factor
...	...
itemset J	factor

\$category2

itemset 1	factor
itemset 2	factor
...	...
itemset J	factor

...

\$categoryC

itemset 1	factor
itemset 2	factor
...	...
itemset J	factor

or data.frame (according to the value of **as_character**)

	category 1	category 2	...	category C
itemset 1	vector(character)	vector(character)	...	vector(character)
itemset 2	vector(character)	vector(character)	...	vector(character)
...
itemset J	vector(character)	vector(character)	...	vector(character)

- **check_access_for_category(category: character or numeric, value: character, stop: logical):**
logical
- **has_item_names():** logical
- **get_items(items: vector(character) or vector(numeric) according to the attribute items):**
see attribute **items**
- **get_items_from_category(category: character or numeric, value: character,**
force_character: logical): vector(character) or vector(numeric)
- **get_tnp(tnp: character or TransactionSet or see attribute nodes or patterns, entities: character):**
TransactionSet or see attribute **nodes** or **patterns**
- **get_tnp_itemsets(tnp: character or list(vector(character)), entities: character):**
list(vector(character))
- **which_entities(npr: see attribute nodes or patterns or return of function extract_rules,**
entities: character): character
- **which_associated_links(name: character):** character
- **which_name(name: character or vector(character)):** character or vector(character)