

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. attributes and methods not exported).

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,
 count: numeric,
 min_length: numeric,
 max_length: numeric,
 status_limit: numeric)

- + **nodes**: data.frame

node	length	frequency
vector(character)	numeric	numeric

- + **nodes_per_year**: matrix

	year 1	year 2	...	year Y
node 1	numeric	numeric	...	numeric
node 2	numeric	numeric	...	numeric
...
node N	numeric	numeric	...	numeric

- + **n_links**: matrix

	node 1	node 2	...	node N
node 1	numeric	numeric	...	numeric
node 2	numeric	numeric	...	numeric
...
node N	numeric	numeric	...	numeric

+ **node_links**: data.frame

endpoint.1	endpoint.2	items	weight
numeric	numeric	character	numeric

+ **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	frequency	weight	specificity	status
vector(character)	numeric	numeric	numeric	numeric	numeric	character

+ **patterns_per_year**: matrix

	year 1	year 2	...	year Y
pattern 1	numeric	numeric	...	numeric
pattern 2	numeric	numeric	...	numeric
...
pattern P	numeric	numeric	...	numeric

+ **p_links**: matrix

	pattern 1	pattern 2	...	pattern P
pattern 1	numeric	numeric	...	numeric
pattern 2	numeric	numeric	...	numeric
...
pattern P	numeric	numeric	...	numeric

+ **pattern_links**: data.frame

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

Methods

+ **transaction.analyzer**(**transactions**: see attribute **transactions**, **items**: see data.frame below,
target: character, **count**: numeric, **min_length**: numeric,
max_length: numeric, **status_limit**: numeric, **init**: logical, **verbose**: logical):
TransactionAnalyzer

item	name	category 1	category 2	...	category <i>C</i>
character	character	factor	factor	...	factor

+ **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, **count**: numeric, **min_length**: numeric,
max_length: numeric, **arules**: logical): itemsets (class object from arules
package) or data.frame

pattern	frequency
vector(character)	numeric

– **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**(**t**: numeric, **period**: numeric): list

t	numeric
period	numeric

– **compute_reporting_indexes**(**patterns**: list(vector(character)), **t**: numeric, **period**: numeric):
vector(numeric)

– **compute_reporting_indexes_limits**(**patterns**: list(vector(character)), **t**: numeric, **period**: numeric,
short_limit: numeric): matrix

RI.period	RI.limit
numeric	numeric

– **compute_xi_threshold**(**reporting_indexes**: vector(numeric)): numeric

– **compute_ri_threshold**(**reporting_indexes**: vector(numeric), **xi**: numeric): numeric

+ **define_dynamic_status**(**patterns**: list(vector(character)), **t**: numeric, **period**: numeric,
short_limit: numeric): list

[["res"]]: data.frame

RI.period	is.above.threshold.1	RI.limit	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	frequency	weight	specificity	status
numeric	vector(character)	numeric	numeric	numeric	numeric	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(numeric)
2	vector(numeric)
...	...
P	vector(numeric)

[["lengths"]]:

1	vector(numeric)
2	vector(numeric)
...	...
P	vector(numeric)

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

complex	simple
numeric	numeric

+ **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
numeric	vector(character)	numeric	numeric	numeric

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

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

[["edges"]]: data.frame

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

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

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

[["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**): numeric

+ **itemset_chart**(**nopc**: character 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): data.frame

ID	node	length	frequency
numeric	vector(character)	numeric	numeric

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

ID	pattern	year	length	frequency	weight	specificity	status
numeric	vector(character)	numeric	numeric	numeric	numeric	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, **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**(**from**: character or list, **pruning**: logical, **arules**: logical, **as_sets**: logical, ...): rules (class object from arules package) or data.frame

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

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

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

+ **rules_chart**(**rules**: see method **extract_rules**, **items**: see attribute **items**, **parameters**: list, **display**: character, **threshold**: numeric, **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): 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**: TransactionSet, **category**: character or numeric, **value**: character):
TransactionSet

- + **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**

+ **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_item_names(items: vector(character) or vector(numeric) according to the attribute items):**
vector(character)
- **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):**
see attribute **transactions**, **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)