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_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 N or P	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 N or P	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,
more: 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 **itemset** depends on the value of **itemsets**)

antecedent	consequent	support	confidence	lift	frequency	itemset
factor	factor	numeric	numeric	numeric	integer	integer

and (depending on the value of **more**) additional columns preceding the one named **itemset**: see method **compute_additional_rule_indicators**.

− **compute_additional_rule_indicators(rules**: rules (class object from arules package),
transactions: transactions (class from arules package)**)**:
matrix

specificity	accuracy	added.value
numeric	numeric	numeric

+ **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)