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,
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 C
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	f.complex	f.simple	weight	specificity	status
numeric	vector	numeric	numeric	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 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)**: 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(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	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 **itemsets**)

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

+ **rules_chart(rules**: see method **extract_rules**, **items**: see attribute **items**, **parameter**: 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, **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**: 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**

+ **get_item_names(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**)**:
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)