Types of attributes and methods of the SpectralAnalyzer class

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 observations exist.
- $+$ 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

− ***NODES***: character
− ***PATTERNS***: character
− ***RULES***: character
− ***NODES_OR_PATTERNS***: character
− ***NODES_PATTERNS_OR_RULES***: character
− ***NODE_LINKS***: character
− ***PATTERN_LINKS***: character

Attributes

+ **observations**: list

CODE	vector(character) or vector(numeric)	**YEAR**	numeric	**…**	…
CODE	vector(character) or vector(numeric)	**YEAR**	numeric	**…**	…
…	…	**…**	…	**…**	…
CODE	vector(character) or vector(numeric)	**YEAR**	numeric	**…**	…

+ **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	weight
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

+ **obs_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	frequency	weight	order	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

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

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

+ **reset(object**: SpectralAnalyzer, **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_obs_per_year()**: see attribute **nodes_per_year**
– **list_separate_obs()**: 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	weight
vector(character)	numeric

– **list_patterns_by_obs()**: see attribute **obs_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)
– **compute_ksi_threshold(reporting_indexes**: vector(numeric)**)**: numeric
– **compute_ri_threshold(reporting_indexes**: vector(numeric), **ksi**: numeric**)**: numeric
– **compute_reporting_indexes(patterns**: list(vector(character)), **t**: numeric, **period**: numeric**)**: data.frame

pattern	Ri
vector(character)	Numeric

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

t	numeric
period	numeric

− **compute_reporting_indexes_limits(patterns**: list(vector(character)), **first_limit**: numeric,
t: numeric, **period**: numeric**)**: data.frame

pattern	ri_2	ri_period
vector(character)	numeric	numeric

− **define_dynamic_status(patterns**: list(vector(character)), **status_limit**: numeric, **t**: numeric,
period: numeric**)**: data.frame

pattern	Status
vector(character)	character

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

ID	Pattern	frequency	weight	order	specificity	status
numeric	vector(character)	numeric	numeric	numeric	numeric	character

− **plot_spectrum_chart(pc**: see attribute **patterns**,
weights: see method **weight_by_node_complexity**, **title**: character**)**

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

[["weights"]]:

1	vector(numeric)
2	vector(numeric)
…	…
P	vector(numeric)

[["lengths"]]:

1	vector(numeric)
2	vector(numeric)
…	…
P	vector(numeric)

+ **weight_by_node_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	weight	degree
numeric	vector(character)	numeric	numeric	numeric

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

ID	pattern	frequency	weight	order	specificity	status	degree
numeric	vector(character)	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 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 P	numeric	numeric

\+ **cluster_chart(nopc**: character or see attribute **nodes** or **patterns**, **item**: numeric,
identifiers: character, **use_name**: logical, **n.cutoff**: numeric,
vertex_size: character or numeric or vector(numeric),
size_range: vector(numeric), **vertex_col**: character or vector(character),
c.cutoff: numeric, **display_mixt**: logical, **title**: character, **path**: character,
name: character, **…)**: list

[["vertices"]]: data.frame

ID	node	length	weight	degree
numeric	vector(character)	numeric	numeric	numeric

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

ID	pattern	frequency	weight	order	specificity	status	degree
numeric	vector(character)	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"]]: matrix

	x	y
vertex 1	numeric	numeric
vertex 2	numeric	numeric
…	…	…
vertex 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

+ **pattern_chart(pc**: character or see attribute **patterns**, **identifiers**: character, **length_one**: logical,
jitter: logical, **display_status**: logical, **display_text**: 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	pattern	frequency	weight	order	specificity	status
numeric	vector(character)	numeric	numeric	numeric	numeric	character

− **plot_pattern_chart(pc**: see attribute **patterns**, **items_category:** see data.frame below,
category: character, **c.cutoff:** numeric, **use_names**: logical, **n.cutoff**: numeric,
jitter: logical, **display_status**: logical, **display_text:** character, **title:** character**)**

item	category
character	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_tension**: 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_tension**: numeric,
edge_alpha: numeric, **palette**: character, **palette_direction**: numeric**)**: list
[["graph"]]: ggplot2 graph
[["rules"]]: see method **extract_rules**

+ **save_characteristics(characteristics**: character or see attribute **nodes** or **patterns** or return of function **extract_rules**, **…)**

+ **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**

− **check_access_for_category(category**: character or numeric, **value**: character, **stop**: logical**)**: 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_nopc(nopc**: character or see attribute **nodes** or **patterns**, **entities**: character**)**: see attribute **nodes** or **patterns**
− **get_nop(nop**: 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)