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.

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)
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

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

nodes_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

patterns_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**)**: SpectralAnalyzer

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

reset(object: SpectralAnalyzer, **from**: numeric**)**

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 **nodes_links** and **patterns_links**

list_separate_patterns(target: character, **count**: numeric, **min_length**: numeric,
max_length: numeric**)**: 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(numeric)), **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(numeric)), **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(numeric)), **first_limit**: numeric, **t**: numeric,
period: numeric**)**: data.frame

pattern	ri_2	ri_period
vector(character)	numeric	numeric

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

pattern	Status
vector(character)	character

spectrum_chart(patterns_characteristics: 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(patterns_characteristics: see attribute **patterns**,
weights_by_node_type: see data.frame below, **title**: character**)**

complex_nodes	simple_node
numeric	numeric

compute_pattern_distribution_in_nodes(patterns: list(vector(numeric))**)**: list

[["weight_distribution"]]:

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

[["length_distribution"]]:

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

spectrosome_chart(entities: character, **characteristics**: see attribute **nodes** or **patterns**,
identifiers: character, **nb_graphs**: numeric, **min_link_weight**: numeric,
size_range: vector(numeric), **vertex_size**: character, **vertex_col**: 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"]]:

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

or (depends on the value of **entities**)

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

[["edges"]]:

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

or (depends on the value of **entities**)

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 **nodes_links** and **patterns_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(entities: character, **characteristics**: see attribute **nodes** or **patterns**, **item**: numeric, **identifiers**: character, **use_name**: logical, **n.cutoff**: numeric, **vertex_size**: character, **size_range**: vector(numeric), **vertex_col**: character, **c.cutoff**: numeric, **display_mixt**: logical, **title**: character, **path**: character, **name**: character, **…)**: list

[["vertices"]]:

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

or (depends on the value of **entities**)

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

[["edges"]]:

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

or (depends on the value of **entities**)

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 **nodes_links** or **patterns_links)**: numeric

degree(ID: numeric**, links:** see attribute **nodes_links** or **patterns_links)**: numeric

tree_chart(patterns_characteristics: see attribute **patterns**, **identifiers**: character,
use_names: logical, **n.cutoff**: numeric, **display_status**: logical, **display_text**: character,
c.cutoff: numeric, **title**: character, **path**: character, **name**: character**)**: data.frame

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

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

item	category
character	character

extract_rules(from: character or list, **pruning**: logical, **as_sets**: logical, **…)**: 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

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

check_access_for_category(category: character or numeric, **value**: character, **stop**: logical**)**: logical

get_nodes(nodes_characteristics: 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(nodes_characteristics: see attribute **nodes**, **items**: vector(numeric),
condition: character**)**: see attribute **nodes**
get_nodes_from_characteristic(nodes_characteristics: see attribute **nodes**,
characteristic: character, **value**: numeric,
condition: character**)**: see attribute **nodes**
get_nodes_from_category(nodes_characteristics: see attribute **nodes**,
category: character or numeric, **value**: character,
condition: character**)**: see attribute **nodes**

get_patterns(patterns_characteristics: 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(patterns_characteristics: see attribute **patterns**, **items**: vector(numeric),
condition: character**)**: see attribute **patterns**
get_patterns_from_characteristic(patterns_characteristics: see attribute **patterns**,
characteristic: character, **value**: numeric, **condition**: character**)**:
see attribute **patterns**
get_patterns_from_status(patterns_characteristics: see attribute **patterns**, **value**: vector(character),
condition: character**)**: see attribute **patterns**
get_patterns_from_category(patterns_characteristics: see attribute **patterns**,
category: character or numeric, **value**: character,
condition: character**)**: see attribute **patterns**

get_links(entities : character, **characteristics**: see attribute **nodes** or **patterns)**: see attribute
nodes_links or **patterns_links**
get_isolates(entities: character, **characteristics**: see attribute **nodes** or **patterns)**: see attribute
nodes or **patterns**
get_non_isolates(entities: character, **characteristics**: see attribute **nodes** or **patterns)**: see attribute
nodes or **patterns**
get_complexes(entities: character, **characteristics**: see attribute **nodes** or **patterns**,
category: character or numeric, **condition**: character, **min_nb_values**: numeric**)**: see
attribute **nodes** or **patterns**