definiowanie

literal	make_graph_from_literal(1-2-3, 1-3)	- for an undirected edge, -+ for directed (+ is the arrowhead)
adjacency matrix	graph_from_adjacency_-matrix(matrix_name, mode = "undirected")	mode ="directed" or "undirected"
edgelist	gr1<-graph_from_edgelist-(matrix_name, directed=-FALSE)	directed= "false" or "true" for a directed or non-directed graph

atrybuty

list vertices	V(graph_name)
list edges	E(graph_name)
list degrees	degree(graph_name)
list degrees in oriented graph	degree(graph_name, mode="in"/"o-ut")

files

saving into file	write_graph(graph_name, "file_name.graphml", format = "graphml")

miary centralności wierzchołków

stopień	degree
stopień ważony	strength
pośrednictwo	betweenness
bliskość	closeness
centralność wektora własnego	eigen_centrality
PageRank	page_rank
ekscentryczność	eccentricity
współczynnik klastrowania	

spójność

wyszukiwanie spójnych składowych	components(grap-h_name, mode="weak")	mode = "weak" or "strong"

rysowanie

rysowanie w edytorze	plot(graph_name)
rysowanie ...	tkplot(graphname

drawing add-ons

edge.width = E(graph_name)$weight	
edge.label=E(graph_name)$weight	
edge.label.dist = 0.5	
vertex.color="green"	
vertex.shape = "square"	
vertex.size=8	
layout=layout_type(graph-_name)	layout_in_circle, layout_with_kk, layout_with_fr
vertex.attribute_type	vertex.color, vertex.shape, vertex.size

```
edge_attr(graf1, "weight") <- c(2,2,1,5,1,4,3,2,3,6,4,1,2,1,5,3,2,3,1)

plot(graf1, edge.label = E(graf1)$weight)
```


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