

vngrape

**Vertex Name Centered additions to
GRAPE**

Version 1.0

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Chapter 1

The vngrape Package

This chapter describes the GAP package `vngrape`. It builds on the package `GRAPE`.

1.1 Basic functions

1.1.1 VNI2N

▷ `VNI2N(graph, index_or_list_of_indices)` (function)

Converts all indices in *x* to vertex names.

1.1.2 VNN2I

▷ `VNN2I(graph, name_or_list_of_names)` (function)

Converts all names in *x* to its indices.

1.2 Copied from GRAPE

These function are similar to functions in `GRAPE`, but accepting input as vertex names instead of vertex indices. Not all functionality is available, though.

1.2.1 VNAddedEdgeOrbit

▷ `VNAddedEdgeOrbit(graph, edge_by_names)` (function)

Function that returns the graph *g* but with the orbit of the edge *e* added. The elements of *e* must be vertex names of *g*.

1.2.2 VNAdjacency

▷ `VNAdjacency(graph, vertex_name)` (function)

Function that returns the vertex names of neighbors of *x* in a graph *g*. *x* must be a vertex of *g* given by its name.

1.2.3 VNIsEdge

▷ `VNIsEdge(graph, edge_by_names)` (function)

Function that returns whether *e* (a list of two vertex names) is an edge of the graph *g*.

1.2.4 VNUndirectedEdges

▷ `VNUndirectedEdges(graph)` (function)

Function that returns a list of the undirected edges of a graph *g*. The edges are described by the names of its vertices.

1.2.5 VNDistance

▷ `VNDistance(graph, vertex_or_list, vertex_or_list)` (function)

Function that returns the distance in a graph between two vertices or a vertex and a list of vertices or two lists of vertices. The vertices are given by their names.

1.2.6 VNDistanceSet

▷ `VNDistanceSet(graph, d_or_d's, vertex_or_list)` (function)

Function that returns the set of vertices such that their distance to *v* is *d* (if *d* is a number) or in *d* (if *d* is a list of distances). The vertices of the set are given by their names.

1.2.7 VNInducedSubgraph

▷ `VNInducedSubgraph(graph, list_of_names)` (function)

Function that returns the subgraph of *g* induced by the vertices whose name is in the list *l*

1.3 New functions

1.3.1 VNDotGraph

▷ `VNDotGraph(graph, file_name)` (function)

Function that exports the graph in dot format.

There are two things to do here: do something if the external file exists, and quote brackets and parentheses in vertex names.

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