

vngrape

**Vertex Name Centered additions to
GRAPE**

Version 1.0

19 February 2013

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Acknowledgements

Big thanks to Leonard H. Soicher, author of the package *GRAPE*.

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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.

We should do something if the external file exists. Currently it appends data. The resulting dot graph could be visualized at <http://graphviz-dev.appspot.com/>, for example.

1.3.2 VNPNGGraph

▷ `VNPNGGraph(graph)` (function)

Function that produces a drawing of a graph using graphviz (see graphviz.org).

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