

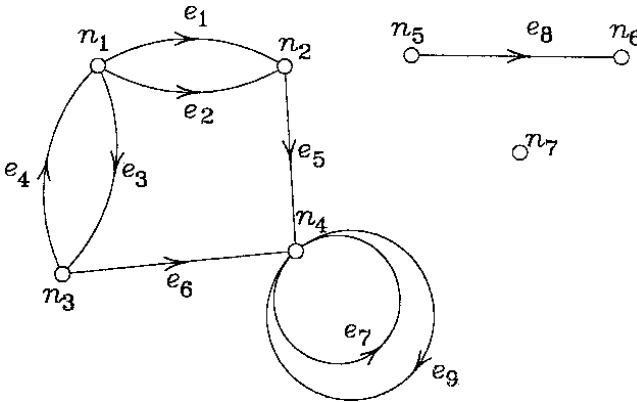
Multidimensional Outlines – Wordgraphs

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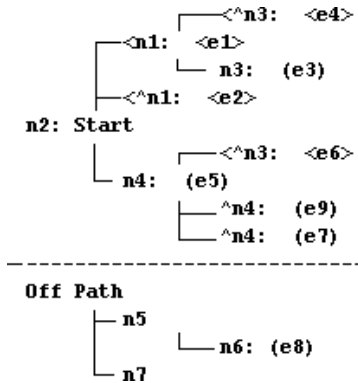
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Abstract. A wordgraph is a multidimensional outline capable of representing arbitrary finite directed graphs. For example the following pictorial directed graph:



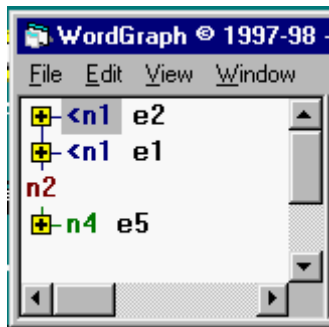
Can be represented as a wordgraph with n_2 as the start node as follows:



The example contains 9 directed edges and 7 nodes. The start node is placed at the left hand edge of the document as would the root of an outline, all edges incident into to that node are placed above it, indented and represented uniquely with a less than symbol, '<'. Any edges incident out of a node are placed below and indented one level as in outlining. If a node has been previously presented then a caret '^' is placed before the node to show that it is expanded elsewhere. In terms of a spanning tree these edges represented by their nodes would be cross edges.

Outlining is increasingly adapted as a navigation, organizational and visualization tool for computer applications and is a very powerful metaphor for representing hierarchical or tree structures. Prior to Wordgraph, arbitrary complex systems could not be represented in an outline form.

Implemented as a computer control or component, common techniques used with outline controls are employed: expansion and contraction with plus and minus objects, focusing on a particular node or edge and the use of icons to represent the entities represented by the nodes. Wordgraph provides great utility for applications where navigation, visualization and organization of complex systems is required. Changing the start node is accomplished by clicking on any node. A path from one node to any other node on the path can be displayed. Any directed graph can be represented as a wordgraph. The following is a contracted view representing the example from above:



Wordgraph is patent protected technology which simplifies graph drawing by reducing the reliance on pictorial representations.