

**NAME**

gv\_perl - graph manipulation in perl

**SYNOPSIS**

```
#!/usr/bin/perl
use gv;
```

**USAGE****INTRODUCTION**

**gv\_perl** is a dynamically loaded extension for **perl** that provides access to the graph facilities of **graphviz**.

**COMMANDS****New graphs**

New empty graph

```
graph_handle gv::graph (name);
graph_handle gv::digraph (name);
graph_handle gv::strictgraph (name);
graph_handle gv::strictdigraph (name);
```

New graph from a dot-syntax string or file

```
graph_handle gv::readstring (string);
graph_handle gv::read (string filename);
graph_handle gv::read (channel);
```

Add new subgraph to existing graph

```
graph_handle gv::graph (graph_handle, name);
```

**New nodes**

Add new node to existing graph

```
node_handle gv::node (graph_handle, name);
```

**New edges**

Add new edge between existing nodes

```
edge_handle gv::edge (tail_node_handle, head_node_handle);
```

Add a new edge between an existing tail node, and a named head node which will be induced in the graph if it doesn't already exist

```
edge_handle gv::edge (tail_node_handle, head_name);
```

Add a new edge between an existing head node, and a named tail node which will be induced in the graph if it doesn't already exist

```
edge_handle gv::edge (tail_name, head_node_handle);
```

Add a new edge between named tail and head nodes which will be induced in the graph if they don't already exist

```
edge_handle gv::edge (graph_handle, tail_name, head_name);
```

**Setting attribute values**

Set value of named attribute of graph/node/edge - creating attribute if necessary

```
string gv::setv (graph_handle, attr_name, attr_value);
string gv::setv (node_handle, attr_name, attr_value);
string gv::setv (edge_handle, attr_name, attr_value);
```

Set value of existing attribute of graph/node/edge (using attribute handle)

```
string gv::setv (graph_handle, attr_handle, attr_value);
string gv::setv (node_handle, attr_handle, attr_value);
```

```
string gv::setv (edge_handle, attr_handle, attr_value);
```

### Getting attribute values

Get value of named attribute of graph/node/edge

```
string gv::getv (graph_handle, attr_name);
string gv::getv (node_handle, attr_name);
string gv::getv (edge_handle, attr_name);
```

Get value of attribute of graph/node/edge (using attribute handle)

```
string gv::getv (graph_handle, attr_handle);
string gv::getv (node_handle, attr_handle);
string gv::getv (edge_handle, attr_handle);
```

### Obtain names from handles

```
string gv::nameof (graph_handle);
string gv::nameof (node_handle);
string gv::nameof (attr_handle);
```

### Find handles from names

```
graph_handle gv::findsubg (graph_handle, name);
node_handle gv::findnode (graph_handle, name);
edge_handle gv::findedge (tail_node_handle, head_node_handle);
attribute_handle gv::findattr (graph_handle, name);
attribute_handle gv::findattr (node_handle, name);
attribute_handle gv::findattr (edge_handle, name);
```

### Misc graph navigators returning handles

```
node_handle gv::headof (edge_handle);
node_handle gv::tailof (edge_handle);
graph_handle gv::graphof (graph_handle);
graph_handle gv::graphof (edge_handle);
graph_handle gv::graphof (node_handle);
graph_handle gv::rootof (graph_handle);
```

### Obtain handles of proto node/edge for setting default attribute values

```
node_handle gv::protonode (graph_handle);
edge_handle gv::protoedge (graph_handle);
```

### Iterators

Iteration termination tests

```
bool gv::ok (graph_handle);
bool gv::ok (node_handle);
bool gv::ok (edge_handle);
bool gv::ok (attr_handle);
```

Iterate over subgraphs of a graph

```
graph_handle gv::firstsubg (graph_handle);
graph_handle gv::nextsubg (graph_handle, subgraph_handle);
```

Iterate over supergraphs of a graph (obscure and rarely useful)

```
graph_handle gv::firstsupg (graph_handle);
graph_handle gv::nextsupg (graph_handle, subgraph_handle);
```

Iterate over edges of a graph

```
edge_handle gv::firstedge (graph_handle);
edge_handle gv::nextedge (graph_handle, edge_handle);
```

Iterate over outedges of a graph

```
edge_handle gv::firstout (graph_handle);  
edge_handle gv::nextout (graph_handle, edge_handle);
```

Iterate over edges of a node

```
edge_handle gv::firstedge (node_handle);  
edge_handle gv::nextedge (node_handle, edge_handle);
```

Iterate over out-edges of a node

```
edge_handle gv::firstout (node_handle);  
edge_handle gv::nextout (node_handle, edge_handle);
```

Iterate over head nodes reachable from out-edges of a node

```
node_handle gv::firsthead (node_handle);  
node_handle gv::nexthead (node_handle, head_node_handle);
```

Iterate over in-edges of a graph

```
edge_handle gv::firstin (graph_handle);  
edge_handle gv::nextin (node_handle, edge_handle);
```

Iterate over in-edges of a node

```
edge_handle gv::firstin (node_handle);  
edge_handle gv::nextin (graph_handle, edge_handle);
```

Iterate over tail nodes reachable from in-edges of a node

```
node_handle gv::firsttail (node_handle);  
node_handle gv::nexttail (node_handle, tail_node_handle);
```

Iterate over nodes of a graph

```
node_handle gv::firstnode (graph_handle);  
node_handle gv::nextnode (graph_handle, node_handle);
```

Iterate over nodes of an edge

```
node_handle gv::firstnode (edge_handle);  
node_handle gv::nextnode (edge_handle, node_handle);
```

Iterate over attributes of a graph

```
attribute_handle gv::firstattr (graph_handle);  
attribute_handle gv::nextattr (graph_handle, attr_handle);
```

Iterate over attributes of an edge

```
attribute_handle gv::firstattr (edge_handle);  
attribute_handle gv::nextattr (edge_handle, attr_handle);
```

Iterate over attributes of a node

```
attribute_handle gv::firstattr (node_handle);  
attribute_handle gv::nextattr (node_handle, attr_handle);
```

### Remove graph objects

```
bool gv::rm (graph_handle);  
bool gv::rm (node_handle);  
bool gv::rm (edge_handle);
```

### Layout

Annotate a graph with layout attributes and values using a specific layout engine

```
bool gv::layout (graph_handle, string engine);
```

### Render

Render a layout into attributes of the graph

```
bool gv::render (graph_handle);
```

Render a layout to stdout

```
bool gv::render (graph_handle, string format);
```

Render to an open file

```
bool gv::render (graph_handle, string format, channel fout);
```

Render a layout to an unopened file by name

```
bool gv::render (graph_handle, string format, string filename);
```

Render to a string result

```
string gv::renderresult (graph_handle ing, string format);
```

```
gv::renderresult (graph_handle, string format, string outdata);
```

Render to an open channel

```
bool gv::renderchannel (graph_handle, string format, string channelname);
```

Render a layout to a malloc'ed string, to be free'd by the caller

(deprecated - too easy to leak memory)

(still needed for "eval [gv::renderdata \$G tk]" )

```
string gv::renderdata (graph_handle, string format);
```

Writing graph back to file

```
bool gv::write (graph_handle, string filename);
```

```
bool gv::write (graph_handle, channel);
```

Graph transformation tools

```
bool gv::tred (graph_handle);
```

## KEYWORDS

graph, dot, neato, fdp, circo, twopi, perl.