

**NAME**

`gv_sharp` - graph manipulation in sharp

**SYNOPSIS****USAGE****INTRODUCTION**

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

**COMMANDS****New graphs**

New empty graph

```
SWIGTYPE_p_Agraph_t gv.graph (string name);
SWIGTYPE_p_Agraph_t gv.digraph (string name);
SWIGTYPE_p_Agraph_t gv.strictgraph (string name);
SWIGTYPE_p_Agraph_t gv.strictdigraph (string name);
```

New graph from a dot-syntax string or file

```
SWIGTYPE_p_Agraph_t gv.readstring (string string);
SWIGTYPE_p_Agraph_t gv.read (string filename);
SWIGTYPE_p_Agraph_t gv.read (SWIGTYPE_p_FILE f);
```

Add new subgraph to existing graph

```
SWIGTYPE_p_Agraph_t gv.graph (SWIGTYPE_p_Agraph_t g, string name);
```

**New nodes**

Add new node to existing graph

```
SWIGTYPE_p_Anode_t gv.node (SWIGTYPE_p_Agraph_t g, string name);
```

**New edges**

Add new edge between existing nodes

```
SWIGTYPE_p_Aedge_t gv.edge (SWIGTYPE_p_Anode_t t, SWIGTYPE_p_Anode_t h);
```

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

```
SWIGTYPE_p_Aedge_t gv.edge (SWIGTYPE_p_Anode_t t, string hname);
```

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

```
SWIGTYPE_p_Aedge_t gv.edge (string tname, SWIGTYPE_p_Anode_t h);
```

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

```
SWIGTYPE_p_Aedge_t gv.edge (SWIGTYPE_p_Agraph_t g, string tname, string hname);
```

**Setting attribute values**

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

```
string gv.setv (SWIGTYPE_p_Agraph_t g, string attr, string val);
string gv.setv (SWIGTYPE_p_Anode_t n, string attr, string val);
string gv.setv (SWIGTYPE_p_Aedge_t e, string attr, string val);
```

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

```
string gv.setv (SWIGTYPE_p_Agraph_t g, SWIGTYPE_p_Agsym_t a, string val);
string gv.setv (SWIGTYPE_p_Anode_t n, SWIGTYPE_p_Agsym_t a, string val);
string gv.setv (SWIGTYPE_p_Aedge_t e, SWIGTYPE_p_Agsym_t a, string val);
```

## Getting attribute values

Get value of named attribute of graph/node/edge

```
string gv.getv (SWIGTYPE_p_Agraph_t g, string attr);
string gv.getv (SWIGTYPE_p_Anode_t n, string attr);
string gv.getv (SWIGTYPE_p_Aedge_t e, string attr);
```

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

```
string gv.getv (SWIGTYPE_p_Agraph_t g, SWIGTYPE_p_Agsym_t a);
string gv.getv (SWIGTYPE_p_Anode_t n, SWIGTYPE_p_Agsym_t a);
string gv.getv (SWIGTYPE_p_Aedge_t e, SWIGTYPE_p_Agsym_t a);
```

## Obtain names from handles

```
string gv.nameof (SWIGTYPE_p_Agraph_t g);
string gv.nameof (SWIGTYPE_p_Anode_t n);
string gv.nameof (SWIGTYPE_p_Agsym_t a);
```

## Find handles from names

```
SWIGTYPE_p_Agraph_t gv.findsubg (SWIGTYPE_p_Agraph_t g, string name);
SWIGTYPE_p_Anode_t gv.findnode (SWIGTYPE_p_Agraph_t g, string name);
SWIGTYPE_p_Aedge_t gv.findedge (SWIGTYPE_p_Anode_t t, SWIGTYPE_p_Anode_t h);
SWIGTYPE_p_Agsym_t gv.findattr (SWIGTYPE_p_Agraph_t g, string name);
SWIGTYPE_p_Agsym_t gv.findattr (SWIGTYPE_p_Anode_t n, string name);
SWIGTYPE_p_Agsym_t gv.findattr (SWIGTYPE_p_Aedge_t e, string name);
```

## Misc graph navigators returning handles

```
SWIGTYPE_p_Anode_t gv.headof (SWIGTYPE_p_Aedge_t e);
SWIGTYPE_p_Anode_t gv.tailof (SWIGTYPE_p_Aedge_t e);
SWIGTYPE_p_Agraph_t gv.graphof (SWIGTYPE_p_Agraph_t g);
SWIGTYPE_p_Agraph_t gv.graphof (SWIGTYPE_p_Aedge_t e);
SWIGTYPE_p_Agraph_t gv.graphof (SWIGTYPE_p_Anode_t n);
SWIGTYPE_p_Agraph_t gv.rootof (SWIGTYPE_p_Agraph_t g);
```

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

```
SWIGTYPE_p_Anode_t gv.protonode (SWIGTYPE_p_Agraph_t g);
SWIGTYPE_p_Aedge_t gv.protoedge (SWIGTYPE_p_Agraph_t g);
```

## Iterators

Iteration termination tests

```
bool gv.ok (SWIGTYPE_p_Agraph_t g);
bool gv.ok (SWIGTYPE_p_Anode_t n);
bool gv.ok (SWIGTYPE_p_Aedge_t e);
bool gv.ok (SWIGTYPE_p_Agsym_t a);
```

Iterate over subgraphs of a graph

```
SWIGTYPE_p_Agraph_t gv.firstsubg (SWIGTYPE_p_Agraph_t g);
SWIGTYPE_p_Agraph_t gv.nextsubg (SWIGTYPE_p_Agraph_t g, SWIGTYPE_p_Agraph_t sg);
```

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

```
SWIGTYPE_p_Agraph_t gv.firstsupg (SWIGTYPE_p_Agraph_t g);
SWIGTYPE_p_Agraph_t gv.nextsupg (SWIGTYPE_p_Agraph_t g, SWIGTYPE_p_Agraph_t sg);
```

Iterate over edges of a graph

```
SWIGTYPE_p_Aedge_t gv.firstedge (SWIGTYPE_p_Agraph_t g);
SWIGTYPE_p_Aedge_t gv.nextedge (SWIGTYPE_p_Agraph_t g, SWIGTYPE_p_Aedge_t e);
```

Iterate over outedges of a graph

```
SWIGTYPE_p_Aedge_t gv.firstout (SWIGTYPE_p_Agraph_t g);
SWIGTYPE_p_Aedge_t gv.nextout (SWIGTYPE_p_Agraph_t g, SWIGTYPE_p_Aedge_t e);
```

Iterate over edges of a node

```
SWIGTYPE_p_Agedge_t gv.firstedge (SWIGTYPE_p_Agnode_t n);
SWIGTYPE_p_Agedge_t gv.nextedge (SWIGTYPE_p_Agnode_t n, SWIGTYPE_p_Agedge_t e);
```

Iterate over out-edges of a node

```
SWIGTYPE_p_Agedge_t gv.firstout (SWIGTYPE_p_Agnode_t n);
SWIGTYPE_p_Agedge_t gv.nextout (SWIGTYPE_p_Agnode_t n, SWIGTYPE_p_Agedge_t e);
```

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

```
SWIGTYPE_p_Agnode_t gv.firsthead (SWIGTYPE_p_Agnode_t n);
SWIGTYPE_p_Agnode_t gv.nexthead (SWIGTYPE_p_Agnode_t n, SWIGTYPE_p_Agnode_t h);
```

Iterate over in-edges of a graph

```
SWIGTYPE_p_Agedge_t gv.firstin (SWIGTYPE_p_Agraph_t g);
SWIGTYPE_p_Agedge_t gv.nextin (SWIGTYPE_p_Agraph_t g, SWIGTYPE_p_Agedge_t e);
```

Iterate over in-edges of a node

```
SWIGTYPE_p_Agedge_t gv.firstin (SWIGTYPE_p_Agnode_t n);
SWIGTYPE_p_Agedge_t gv.nextin (SWIGTYPE_p_Agraph_t g, SWIGTYPE_p_Agedge_t e);
```

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

```
SWIGTYPE_p_Agnode_t gv.firsttail (SWIGTYPE_p_Agnode_t n);
SWIGTYPE_p_Agnode_t gv.nexttail (SWIGTYPE_p_Agnode_t n, SWIGTYPE_p_Agnode_t t);
```

Iterate over nodes of a graph

```
SWIGTYPE_p_Agnode_t gv.firstnode (SWIGTYPE_p_Agraph_t g);
SWIGTYPE_p_Agnode_t gv.nextnode (SWIGTYPE_p_Agraph_t g, SWIGTYPE_p_Agnode_t n);
```

Iterate over nodes of an edge

```
SWIGTYPE_p_Agnode_t gv.firstnode (SWIGTYPE_p_Agedge_t e);
SWIGTYPE_p_Agnode_t gv.nextnode (SWIGTYPE_p_Agedge_t e, SWIGTYPE_p_Agnode_t n);
```

Iterate over attributes of a graph

```
SWIGTYPE_p_Agsym_t gv.firstattr (SWIGTYPE_p_Agraph_t g);
SWIGTYPE_p_Agsym_t gv.nextattr (SWIGTYPE_p_Agraph_t g, SWIGTYPE_p_Agsym_t a);
```

Iterate over attributes of an edge

```
SWIGTYPE_p_Agsym_t gv.firstattr (SWIGTYPE_p_Agedge_t e);
SWIGTYPE_p_Agsym_t gv.nextattr (SWIGTYPE_p_Agedge_t e, SWIGTYPE_p_Agsym_t a);
```

Iterate over attributes of a node

```
SWIGTYPE_p_Agsym_t gv.firstattr (SWIGTYPE_p_Agnode_t n);
SWIGTYPE_p_Agsym_t gv.nextattr (SWIGTYPE_p_Agnode_t n, SWIGTYPE_p_Agsym_t a);
```

### Remove graph objects

```
bool gv.rm (SWIGTYPE_p_Agraph_t g);
bool gv.rm (SWIGTYPE_p_Agnode_t n);
bool gv.rm (SWIGTYPE_p_Agedge_t e);
```

### Layout

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

```
bool gv.layout (SWIGTYPE_p_Agraph_t g, string engine);
```

### Render

Render a layout into attributes of the graph

```
bool gv.render (SWIGTYPE_p_Agraph_t g);
```

Render a layout to stdout

```
bool gv.render (SWIGTYPE_p_Agraph_t g, string format);
```

Render to an open file

```
bool gv.render (SWIGTYPE_p_Agraph_t g, string format, SWIGTYPE_p_FILE fout);
```

Render a layout to an unopened file by name

*bool* **gv.render** (*SWIGTYPE\_p\_Agraph\_t* g, *string format*, *string filename*);

Render to a string result

*string* **gv.renderresult** (*SWIGTYPE\_p\_Agraph\_t* ing, *string format*);

**gv.renderresult** (*SWIGTYPE\_p\_Agraph\_t* g, *string format*, *string outdata*);

Render to an open channel

*bool* **gv.renderchannel** (*SWIGTYPE\_p\_Agraph\_t* g, *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** (*SWIGTYPE\_p\_Agraph\_t* g, *string format*);

Writing graph back to file

*bool* **gv.write** (*SWIGTYPE\_p\_Agraph\_t* g, *string filename*);

*bool* **gv.write** (*SWIGTYPE\_p\_Agraph\_t* g, *SWIGTYPE\_p\_FILE* f);

Graph transformation tools

*bool* **gv.tred** (*SWIGTYPE\_p\_Agraph\_t* g);

## KEYWORDS

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