

GVGEN

5 June 2012

NAME

gvgen - generate graphs

SYNOPSIS

```
gvgen [ -dv? ] [ -in ] [ -cn ] [ -Cx,y ] [ -g[f]x,y ] [ -G[f]x,y ] [ -hn ] [ -kn ] [
-bx,y ] [ -Bx,y ] [ -mn ] [ -Mx,y ] [ -pn ] [ -rx,y ] [ -Rx ] [ -sn ] [ -Sn ] [ -Sn,d ]
[ -tn ] [ -td,n ] [ -Tx,y ] [ -Tx,y,u,v ] [ -wn ] [ -nprefix ] [ -Nname ] [ -ooutfile ]
```

DESCRIPTION

gvgen generates a variety of simple, regularly-structured abstract graphs.

OPTIONS

The following options are supported:

- c *n*** Generate a cycle with *n* vertices and edges.
- C *x,y*** Generate an *x* by *y* cylinder. This will have x^*y vertices and $2^*x^*y - y$ edges.
- g [*f*]*x,y*** Generate an *x* by *y* grid. If **f** is given, the grid is folded, with an edge attaching each pair of opposing corner vertices. This will have x^*y vertices and $2^*x^*y - y - x$ edges if unfolded and $2^*x^*y - y - x + 2$ edges if folded.
- G [*f*]*x,y*** Generate an *x* by *y* partial grid. If **f** is given, the grid is folded, with an edge attaching each pair of opposing corner vertices. This will have x^*y vertices.
- h *n*** Generate a hypercube of degree *n*. This will have $2^{\wedge}n$ vertices and $n^*2^{\wedge}(n-1)$ edges.

- k** n Generate a complete graph on n vertices with $n*(n-1)/2$ edges.
- b** x,y Generate a complete x by y bipartite graph. This will have $x*y$ vertices and $x*y$ edges.
- B** x,y Generate an x by y ball, i.e., an x by y cylinder with two "cap" nodes closing the ends. This will have $x*y + 2$ vertices and $2*x*y + y$ edges.
- m** n Generate a triangular mesh with n vertices on a side. This will have $(n+1)*n/2$ vertices and $3*(n-1)*n/2$ edges.
- M** x,y Generate an x by y Moebius strip. This will have $x*y$ vertices and $2*x*y - y$ edges.
- p** n Generate a path on n vertices. This will have $n-1$ edges.
- r** x,y Generate a random graph. The number of vertices will be the largest value of the form 2^n-1 less than or equal to x . Larger values of y increase the density of the graph.
- R** x Generate a random rooted tree on x vertices.
- s** n Generate a star on n vertices. This will have $n-1$ edges.
- S** n Generate a Sierpinski graph of order n . This will have $3*(3^{n-1} + 1)/2$ vertices and 3^n edges.
- S** n,d Generate a d -dimensional Sierpinski graph of order n . At present, d must be 2 or 3. For d equal to 3, there will be $4*(4^{n-1} + 1)/2$ vertices and $6 * 4^{n-1}$ edges.
- t** n Generate a binary tree of height n . This will have 2^n-1 vertices and 2^n-2 edges.
- t** h,n Generate a n -ary tree of height h .
- T** x,y
- T** x,y,u,v Generate an x by y torus. This will have $x*y$ vertices and $2*x*y$ edges. If u and v are given, they specify twists of that amount in the horizontal and vertical directions, respectively.
- w** n Generate a path on n vertices. This will have $n-1$ edges.
- i** n Generate n graphs of the requested type. At present, only available if the **-R** flag is used.
- n** *prefix* Normally, integers are used as node names. If *prefix* is specified, this will be prepended to the integer to create the name.
- N** *name* Use *name* as the name of the graph. By default, the graph is anonymous.
- o** *outfile* If specified, the generated graph is written into the file *outfile*. Otherwise, the graph is written to standard out.

- d Make the generated graph directed.
- v Verbose output.
- ? Print usage information.

EXIT STATUS

gvgen exits with 0 on successful completion, and exits with 1 if given an ill-formed or incorrect flag, or if the specified output file could not be opened.

AUTHOR

Emden R. Gansner <erg@research.att.com>

SEE ALSO

gc(1), acyclic(1), gvpr(1), gvcolor(1), ccomps(1), sccmap(1), tred(1), libgraph(3)