

NAME

gvgen – generate graphs

SYNOPSIS

gvgen [**-dv?**] [**-in**] [**-cn**] [**-C***x,y*] [**-g**/**f**/*x,y*] [**-G**/**f**/*x,y*] [**-hn**] [**-kn**] [**-b***x,y*] [**-B***x,y*] [**-mn**] [**-M***x,y*] [**-pn**] [**-r***x,y*] [**-R***x*] [**-sn**] [**-Sn**] [**-S***n,d*] [**-tn**] [**-td**,*n*] [**-T***x,y*] [**-T***x,y,u,v*] [**-wn**] [**-n***prefix*] [**-N***name*] [**-o***outfile*]

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^n vertices and $n*2^{(n-1)}$ 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)