1. Queen moves. This is a short demonstration of how to generate and traverse graphs with the Stanford GraphBase. It creates a graph with 12 vertices, representing the cells of a 3×4 rectangular board; two cells are considered adjacent if you can get from one to another by a queen move. Then it prints a description of the vertices and their neighbors, on the standard output file.

An ASCII file called `queen.gb` is also produced. Other programs can obtain a copy of the queen graph by calling *restore_graph*(`"queen.gb"`). You might find it interesting to compare the output of QUEEN with the contents of `queen.gb`; the former is intended to be readable by human beings, the latter by computers.

```
#include "gb_graph.h"   /* we use the GB_GRAPH data structures */
#include "gb_basic.h"   /* we test the basic graph operations */
#include "gb_save.h"   /* and we save our results in ASCII format */

  main()
  { Graph *g, *gg, *ggg;
    g = board(3L, 4L, 0L, 0L, -1L, 0L, 0L);   /* a graph with rook moves */
    gg = board(3L, 4L, 0L, 0L, -2L, 0L, 0L);   /* a graph with bishop moves */
    ggg = gunion(g, gg, 0L, 0L);   /* a graph with queen moves */
    save_graph(ggg, "queen.gb");   /* generate an ASCII file for ggg */
    ⟨Print the vertices and edges of ggg 2⟩;
    return 0;   /* normal exit */
  }
```

2. ⟨Print the vertices and edges of *ggg* 2⟩ ≡

```
  if (ggg ≡ Λ) printf("Something␣went␣wrong␣(panic␣code␣%ld)!\n", panic_code);
  else {
    register Vertex *v;   /* current vertex being visited */
    printf("Queen␣Moves␣on␣a␣3x4␣Board\n\n");
    printf("␣␣The␣graph␣whose␣official␣name␣is\n%s\n", ggg→id);
    printf("␣␣has␣%ld␣vertices␣and␣%ld␣arcs:\n\n", ggg→n, ggg→m);
    for (v = ggg→vertices; v < ggg→vertices + ggg→n; v++) {
      register Arc *a;   /* current arc from v */
      printf("%s\n", v→name);
      for (a = v→arcs; a; a = a→next) printf("␣␣->␣%s,␣length␣%ld\n", a→tip→name, a→len);
    }
  }
```

This code is used in section 1.

3. Index.

⟨ Print the vertices and edges of *ggg* 2 ⟩ Used in section 1.

March 30, 2004 at 09:48

QUEEN

Preliminary work on the Stanford GraphBase project was supported in part by National Science Foundation grant CCR-86-10181.