$\S1$ QUEEN-GRAPH QUEEN MOVES 1

1. Queen moves. This trivial program was hacked from QUEEN, which comes with the Stanford GraphBase system. It creates a graph of $n \times n$ vertices, representing the cells of a chessboard; two cells are considered adjacent if you can get from one to another by a queen move. Then it stores the graph as file queen $n \times n$.gb. Other programs can therefore obtain a copy of the queen graph by calling $restore_graph("queen<math>n \times n$.gb").

```
#include "gb_graph.h"
                                      /* we use the GB_GRAPH data structures */
#include "gb_basic.h"
                                      /* we test the basic graph operations */
                                     /* and we save our results in ASCII format */
#include "gb_save.h"
  long n;
                  /* the command-line parameter */
  char buf[100];
  main(\mathbf{int} \ argc, \mathbf{char} * argv[])
  { Graph *g, *gg, *ggg;
     \langle Process the command line 2 \rangle;
     \begin{array}{ll} g = board(n, n, 0_{\rm L}, 0_{\rm L}, -1_{\rm L}, 0_{\rm L}, 0_{\rm L}); & /* \text{ a graph with rook moves } */\\ gg = board(n, n, 0_{\rm L}, 0_{\rm L}, -2_{\rm L}, 0_{\rm L}, 0_{\rm L}); & /* \text{ a graph with bishop moves } */\\ \end{array}
     ggg = gunion(g, gg, 0_L, 0_L); /* a graph with queen moves */
     sprintf(buf, "queen%ldx%ld.gb", n, n);
                                      /* generate an ASCII file for ggg */
     save\_graph(ggg, buf);
                       /* normal exit */
     return 0;
  }
2. \langle \text{Process the command line 2} \rangle \equiv
  if (argc \neq 2 \lor sscanf(argv[1], "%ld", &n) \neq 1) {
     fprintf(stderr, "Usage: \_\%s\_n \n", argv[0]);
     exit(-1);
  }
This code is used in section 1.
```

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3. Index.

 $argc: \ \ 1, \ 2.$ $argv: \ \ 1, \ 2.$ $board: \ \ 1.$ $buf: \ \ 1.$ $exit: \ \ 2.$ $fprintf: \ \ 2.$ $g: \ \ 1.$ $ggs: \ \ 1.$ $gggs: \ \ 1.$ $gunion: \ \ 1.$ $gunion: \ \ 1.$ $main: \ \ 1.$ $restore_graph: \ \ 1.$ $save_graph: \ \ 1.$ $sprintf: \ \ 1.$ $sprintf: \ \ 1.$ $sscanf: \ \ 2.$ $stderr: \ \ 2.$

Queen-graph names of the sections 3

 $\big\langle \, \text{Process the command line } \, 2 \, \big\rangle \quad \text{Used in section 1}.$

QUEEN-GRAPH

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