

1. Intro. This program makes DLX data to find all ways to attack or occupy all cells of an $n \times n$ board with m queens.

```
#define maxn 16      /* hexadecimal limitation */
#include <stdio.h>
#include <stdlib.h>
int m, n;           /* command-line parameters */
main(int argc, char *argv[])
{
    register int i, j, k;
    ⟨Process the command line 2⟩;
    ⟨Print the item-name line 3⟩;
    for (i = 0; i < n; i++)
        for (j = 0; j < n; j++) ⟨Print the option for a queen at position (i,j) 4⟩;
}
```

2. ⟨Process the command line 2⟩ \equiv

```
if (argc  $\neq$  3  $\vee$  sscanf(argv[1], "%d", &n)  $\neq$  1  $\vee$  sscanf(argv[2], "%d", &m)  $\neq$  1) {
    fprintf(stderr, "Usage: %s %d %d\n", argv[0]);
    exit(-1);
}
if (n > maxn) {
    fprintf(stderr, "Sorry, I don't presently allow %d!\n", maxn);
    exit(-2);
}
printf("%s %d %d\n", argv[0], n, m);
```

This code is used in section 1.

3. ⟨Print the item-name line 3⟩ \equiv

```
for (i = 0; i < n; i++)
    for (j = 0; j < n; j++) printf("1:%d|%x%x", m, i, j);
printf("%d|Q\n", m);
```

This code is used in section 1.

4. ⟨Print the option for a queen at position (i, j) 4⟩ \equiv

```
{
    printf("Q_%x%x", i, j);
    for (k = 0; k < n; k++)
        if (k  $\neq$  i) printf("_%x%x", k, j);
    for (k = 0; k < n; k++)
        if (k  $\neq$  j) printf("_%x%x", i, k);
    for (k = 1; i + k < n  $\wedge$  j + k < n; k++) printf("_%x%x", i + k, j + k);
    for (k = 1; i - k  $\geq$  0  $\wedge$  j - k  $\geq$  0; k++) printf("_%x%x", i - k, j - k);
    for (k = 1; i + k < n  $\wedge$  j - k  $\geq$  0; k++) printf("_%x%x", i + k, j - k);
    for (k = 1; i - k  $\geq$  0  $\wedge$  j + k < n; k++) printf("_%x%x", i - k, j + k);
    printf("\n");
}
```

This code is used in section 1.

5. Index.*argc*: 1, 2.*argv*: 1, 2.*exit*: 2.*fprintf*: 2.*i*: 1.*j*: 1.*k*: 1.*m*: 1.*main*: 1.*maxn*: 1, 2.*n*: 1.*printf*: 2, 3, 4.*sscanf*: 2.*stderr*: 2.

⟨ Print the item-name line 3 ⟩ Used in section 1.

⟨ Print the option for a queen at position (i, j) 4 ⟩ Used in section 1.

⟨ Process the command line 2 ⟩ Used in section 1.

QUEENDOM-DLX

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