

N-Queens

```
#include <stdio.h>
#include <stdbool.h>

#define N 8

int board[N][N];

bool isSafe(int row, int col) {
    int i, j;
    for (i = 0; i < col; i++)
        if (board[row][i])
            return false;
    for (i = row, j = col; i >= 0 && j >= 0; i--, j--)
        if (board[i][j])
            return false;
    for (i = row, j = col; j >= 0 && i < N; i++, j--)
        if (board[i][j])
            return false;
    return true;
}

bool solveNQ(int col) {
    if (col >= N)
```

```
    board[0][col] = 1;
```

```
    if (isSafe(0, col))
```

```
        if (col == N - 1)
```

```
            printf("Solution %d:\n", i + 1);
```

```
            for (int j = 0; j < N; j++)
                printf("%d ", board[i][j]);
```

```
            printf("\n");
```

```
    return true;

    for (int i = 0; i < N; i++) {
        if (isSafe(i, col)) {
            board[i][col] = 1;

            if (solveNQ(col + 1))
                return true;

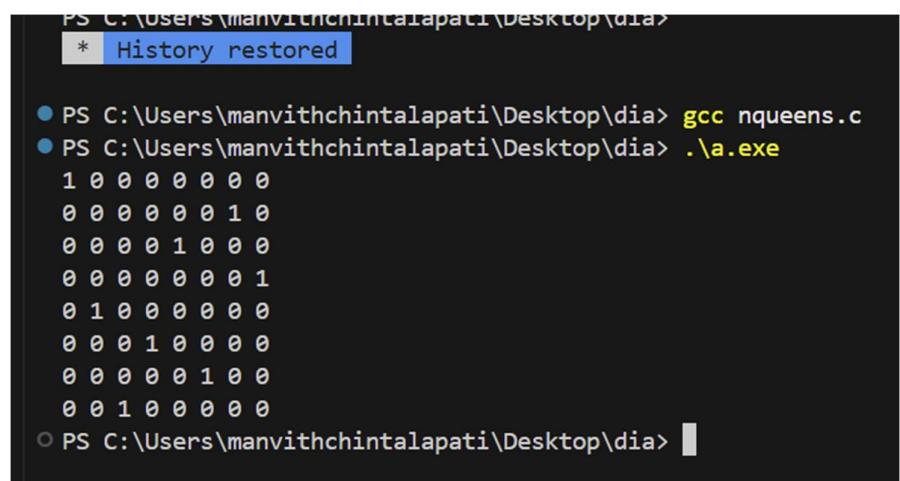
            board[i][col] = 0;
        }
    }

    return false;
}

void printSolution() {
    for (int i = 0; i < N; i++) {
        for (int j = 0; j < N; j++)
            printf("%d ", board[i][j]);
        printf("\n");
    }
}

int main() {
    for (int i = 0; i < N; i++)
        for (int j = 0; j < N; j++)
            board[i][j] = 0;
```

```
if (solveNQ(0) == false) {  
    printf("Solution does not exist\n");  
    return 0;  
}  
  
printSolution();  
return 0;  
}
```



The screenshot shows a Windows Command Prompt window with the following history:

- PS C:\Users\manvithchintalapati\Desktop\dia> * History restored
- PS C:\Users\manvithchintalapati\Desktop\dia> gcc nqueens.c
- PS C:\Users\manvithchintalapati\Desktop\dia> .\a.exe

The output of the program is displayed below the command:

```
1 0 0 0 0 0 0  
0 0 0 0 0 0 1 0  
0 0 0 0 1 0 0 0  
0 0 0 0 0 0 0 1  
0 1 0 0 0 0 0 0  
0 0 0 1 0 0 0 0  
0 0 0 0 0 1 0 0  
0 0 1 0 0 0 0 0
```