

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)
```

```
        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");
    }
}
```

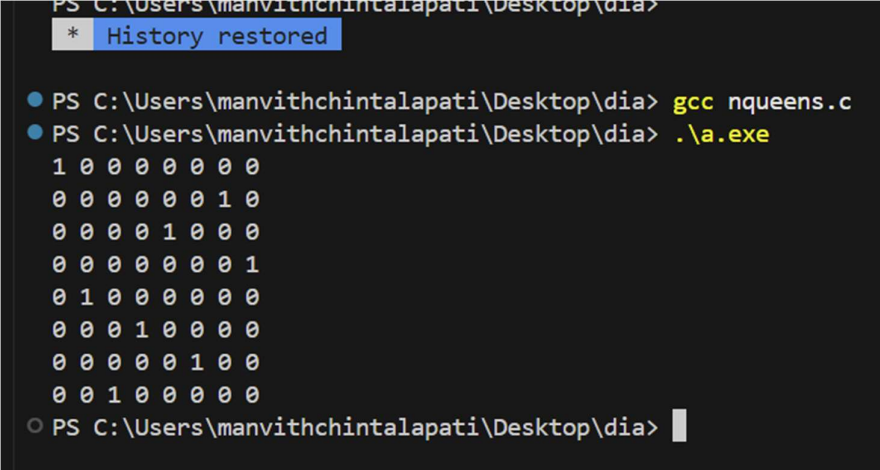
```
int main() {
    for (int i = 0; i < N; i++)
        for (int j = 0; j < N; j++)
            board[i][j] = 0;
```

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

```
printSolution();
```

```
return 0;
```

```
}
```



A screenshot of a Windows PowerShell terminal window. The title bar shows the path 'C:\Users\manvithchintalapati\Desktop\dia'. The terminal content includes a message '* History restored' and two command prompts. The first prompt shows the command 'gcc nqueens.c' being executed. The second prompt shows the command './a.exe' being executed, which results in an 8x8 grid of 0s and 1s representing a solution to the 8-Queens problem. The grid has 8 rows and 8 columns. The 1s are located at (row, column) positions: (1,1), (2,8), (3,3), (4,4), (5,7), (6,2), (7,6), and (8,5). All other positions contain 0s.

```
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  
1 0 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  
PS C:\Users\manvithchintalapati\Desktop\dia>
```