Description:

C program that solves the N-Queens problem, prints one valid board configuration, and reports execution time using clock().

Source Code:

```
#include <stdio.h>

#include <stdbool.h>

#include <time.h>


#define N 8  // Change this for different board sizes


static void printSolution(int board[N][N])

{

	for (int i = 0; i < N; ++i)

	{

	for (int j = 0; j < N; ++j)

	printf("%c ", board[i][j] ? 'Q' : '.');

	printf("\n");

	}

	printf("\n");

}


static bool isSafe(int board[N][N], int row, int col)

{

	// Check current row on the left side

	for (int i = 0; i < col; ++i)

	if (board[row][i])
```

```
        return false;

        // Check upper-left diagonal
        for (int i = row, j = col; i >= 0 && j >= 0; --i, --j)
        if (board[i][j])
        return false;

        // Check lower-left diagonal
        for (int i = row, j = col; i < N && j >= 0; ++i, --j)
        if (board[i][j])
        return false;

        return true;
}

static bool solveNQUtil(int board[N][N], int col)
{
        if (col >= N)
        return true; // All queens placed

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

```
        return true;
        board[i][col] = 0; // Backtrack
        }
        }
        return false;
}

static void solveNQ(void)
{
        int board[N][N];
        // Initialize to 0
        for (int i = 0; i < N; ++i)
        for (int j = 0; j < N; ++j)
        board[i][j] = 0;

        if (!solveNQUtil(board, 0))
        {
        printf("Solution does not exist.\n");
        return;
        }

        printSolution(board);
}

int main(void)
{
```

```
        clock_t start,end;
        double cpu_time_used;
        start=clock();
        solveNQ();
        end=clock();
        cpu_time_used = ((double)(end-start)) / CLOCKS_PER_SEC;
printf("Execution time: %.6f seconds\n", cpu_time_used);

        return 0;
}
```

Output:

```
Q . . . . . . .
. . . . . . Q .
. . . . Q . . .
. . . . . . . Q
. Q . . . . . .
. . . Q . . . .
. . . . . Q . .
. . Q . . . . .

Execution time: 0.000102 seconds
```