

9913 Mark Lopes

SE Comps A Batch-C

N-Queen:-

```
#include <stdio.h>
#include <stdlib.h>
#include <math.h>

int n;
int col[20] = {0}; // Array to store column positions of queens
int count = 0;

// Function to print the solution (board configuration)
void solution()
{
    int i, j;
    for (i = 1; i <= n; i++)
    {
        for (j = 1; j < col[i]; j++)
            printf("x\t"); // Print 'x' for empty spaces

        printf("q%d\t", i); // Print 'q' for queens
        for (; j <= n; j++)
        {
            printf("x\t"); // Print 'x' for empty spaces
        }
        printf("\n");
    }
}

// Function to check if placing a queen at (q, c) is safe
int place(int q, int c)
{
    int k;
    for (k = 1; k <= q - 1; k++)
    {
        if (col[k] == c || abs(k - q) == abs(col[k] - c))
        {
            return 0;
        }
    }
    return 1;
}

// Function to place queens on the board (backtracking approach)
void nqueen(int q)
```

```

{
    int c;
    for (c = 1; c <= n; c++)
    {
        if (place(q, c))
        {
            col[q] = c; // Place queen at row q, column c
            if (q == n)
            {
                count++;
                printf("\nSolution number: %d\n", count);
                solution(); // Print the solution
            }
            else
            {
                nqueen(q + 1); // Recursively place the next queen
            }
        }
    }
}

int main()
{
    printf("Enter the number of queens: ");
    scanf("%d", &n);

    if (n <= 0)
    {
        printf("Invalid number of queens. Please enter a positive integer.\n");
        return 1;
    }

    nqueen(1); // Start placing queens from the first row

    return 0;
}

```

Microsoft Visual Studio Code - C++ (g++) - C:\Users\Mark Lopes\Desktop\college\Sem\_4\AoA> g++ 4-queens.cpp -std=c++11 -o 4-queens.exe

Enter the number of queens: 4

Solution number: 1

x	q1	x	x	x
x	x	x	q2	x
q3	x	x	x	x
x	x	q4	x	x

Solution number: 2

x	x	q1	x	x
q2	x	x	x	x
x	x	x	q3	x
x	q4	x	x	x

PS C:\Users\Mark Lopes\Desktop\college\Sem\_4\AoA>