Practical 12

Aim: Write a program to solve N-Queens problem.

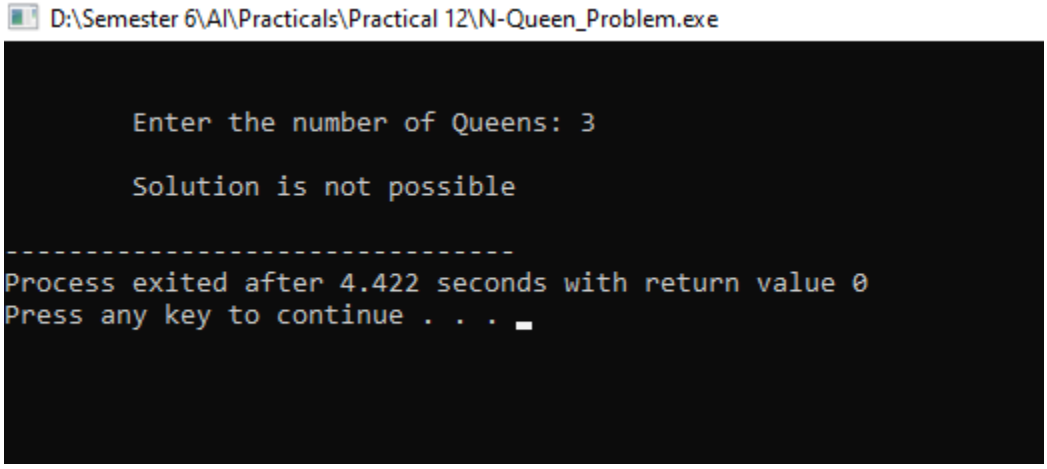
Program:

```
#include<stdio.h>
#include<math.h>
int board[20];
void print(int n)
{
	int i, j, count = 1;
	printf("\n\n\tSolution %d:\n\n", count++);
	printf("\t");
	for(i = 1; i <= n; i++)
		printf("  |\t%d", i);
	printf("\n\t--|------------------------------");
	for(i = 1; i <= n; i++)
	{
		printf("\n\t%d |", i);
		for(j = 1; j <=n; j++)
		{
			if(board[i] == j)
				printf("\tQ");
			else
				printf("\t-");
		}
	}
```

```
}
int place(int row, int column)
{
	int i;
	for(i = 1;i <= row-1; i++)
	{
		if(board[i] == column)
			return 0;
		else
			if(abs(board[i] - column) == abs(i-row))
				return 0;
	}
	return 1;
}
void queen(int row, int n)
{
	for(int column = 1; column <= n; column++)
	{
		if(place(row, column))
		{
			board[row] = column;
			if(row == n)
				print(n);
			else
				queen(row+1, n);
```

```
                }
        }
}
int main()
{
        int n, i, j;
        void queen(int row, int n);
        printf("\n\n\tEnter the number of Queens: ");
        scanf("%d", &n);
        if(n==2 || n==3)
                printf("\n\tSolution is not possible");
        else
                queen(1, n);
        printf("\n");
        return 0;
}
```

Output:



D:\Semester 6\AI\Practicals\Practical 12\N-Queen_Problem.exe

```
        Enter the number of Queens: 4


        Solution 1:

          |     1  |    2  |    3  |    4
        --|--------------------------------
        1 |     -       Q       -       -
        2 |     -       -       -       Q
        3 |     Q       -       -       -
        4 |     -       -       Q       -

        Solution 1:

          |     1  |    2  |    3  |    4
        --|--------------------------------
        1 |     -       -       Q       -
        2 |     Q       -       -       -
        3 |     -       -       -       Q
        4 |     -       Q       -       -

--------------------------------
Process exited after 3.792 seconds with return value 0
Press any key to continue . . .
```