Name : Poojan Shah

Moodle: 20202001

Roll No: 61

AI EXP 05

<div align="center">N Queen Problem</div>

Java Code:

```java
import java.util.*;
public class EightQueens
{
        public static void main(String args[])
        {
                Scanner src=new Scanner (System.in);
                System.out.println ("Enter the number of queens you want to
place :");
                int  N=src.nextInt();
                int[][] board = new int[N][N];
                solve(0, board, N);

                for (int i = 0; i < N; i++)
                {
                        for (int j = 0; j < N; j++)
                        {
                                if (board[i][j]==1)
                                System.out.print ("Q ");
                                else
                                System.out.print("* ");
                        }
                        System.out.println();
                }
        }

        static boolean solve(int row, int[][] board, int N)
        {
                if(row>=N) return true;
                for(int position = 0; position < N; position++)
                {
                        if(isValid(board, row, position, N))
                        {
                                board[row][position] = 1;
                                if(!solve(row+1, board, N))
                                {
                                        board[row][position] = 0;
                                }
                                else
                                 return true;
                        }
                }
                return false;
        }

        static boolean isValid(int[][] board, int x, int y, int N)
```

```java
        {
            int i, j;
            for(i = 0; i < x; i++)
                if(board[i][y]==1)
                    return false;
            i = x - 1;
            j = y - 1;
            while((i>=0)&&(j>=0))
                if(board[i--][j--]==1)
                    return false;
            i = x - 1;
            j = y + 1;
            while((i>=0)&&(j<N))
                if(board[i--][j++]==1)
                    return false;
            return true;
        }
}
```

Program output:

apsit@apsit-HP-280-G3-MT: ~/Documents

File   Edit   View   Search   Terminal   Help

```
apsit@apsit-HP-280-G3-MT:~/Documents$ java EightQueens
Enter the number of queens you want to place :
8
Q * * * * * * *
* * * Q * * * *
* * * * * * * Q
* * * * * Q * *
* * Q * * * * *
* * * * * * Q *
* Q * * * * * *
* * * Q * * * *
apsit@apsit-HP-280-G3-MT:~/Documents$ java EightQueens
Enter the number of queens you want to place :
20
Q * * * * * * * * * * * * * * * * * * *
* * Q * * * * * * * * * * * * * * * * *
* * * * Q * * * * * * * * * * * * * * *
* Q * * * * * * * * * * * * * * * * * *
* * * Q * * * * * * * * * * * * * * * *
* * * * * * * * * * Q * * * * * * * * *
* * * * * * * * * * * * Q * * * * * * *
* * * * * * * * * * * Q * * * * * * * *
* * * * * * * * * * * * * * Q * * * * *
* * * * * * * * * * * * * * * * * * * Q
* * * * * * * * * * * * * * * * Q * * *
* * * * * * * * * * Q * * * * * * * * *
* * * * * * * * * * * * * Q * * * * * *
* * * * * * Q * * * * * * * * * * * * *
* * * * * * * * Q * * * * * * * * * * *
* * * * * * Q * * * * * * * * * * * * *
* * * * * * * * * * * * * Q * * * * * *
* * * * * Q * * * * * * * * * * * * * *
* * * * Q * * * * * * * * * * * * * * *
apsit@apsit-HP-280-G3-MT:~/Documents$ java EightQueens
Enter the number of queens you want to place :
1
Q
apsit@apsit-HP-280-G3-MT:~/Documents$ java EightQueens
Enter the number of queens you want to place :
5
Q * * * *
* * Q * *
* * * * Q
* Q * * *
* * * Q *
```