Write a program to solve any 2 player game scenarios (Eg:4 / 8 Queens) implemented in JAVA

Lab Assignment-2

CSE3002 : Artificial Intelligence

Submitted by:

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Under the Guidance of

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SCOPE

VIT-AP

Task:

Write a program to solve any 2 player game scenarios (Eg:4 / 8 Queens)

Solution:

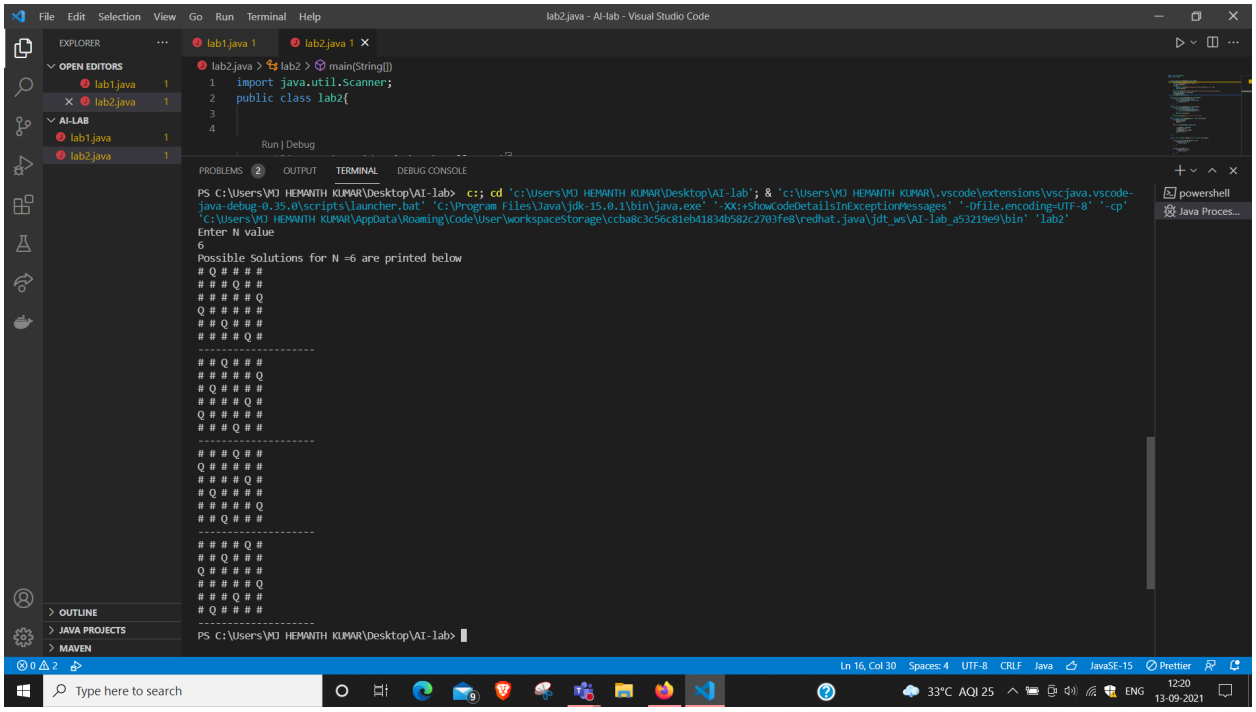
I have used Backtracking to solve this problem using Java

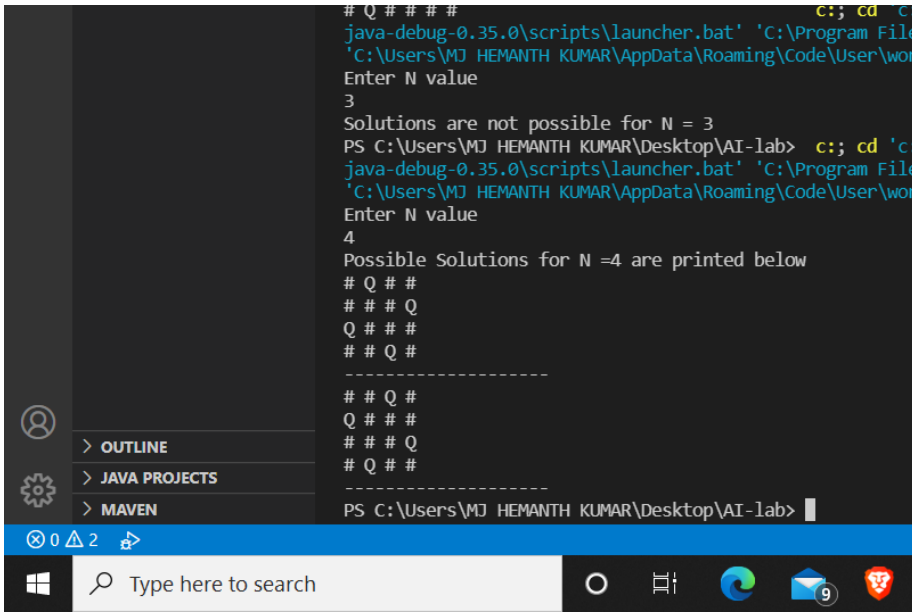
Below is the source code of the same.

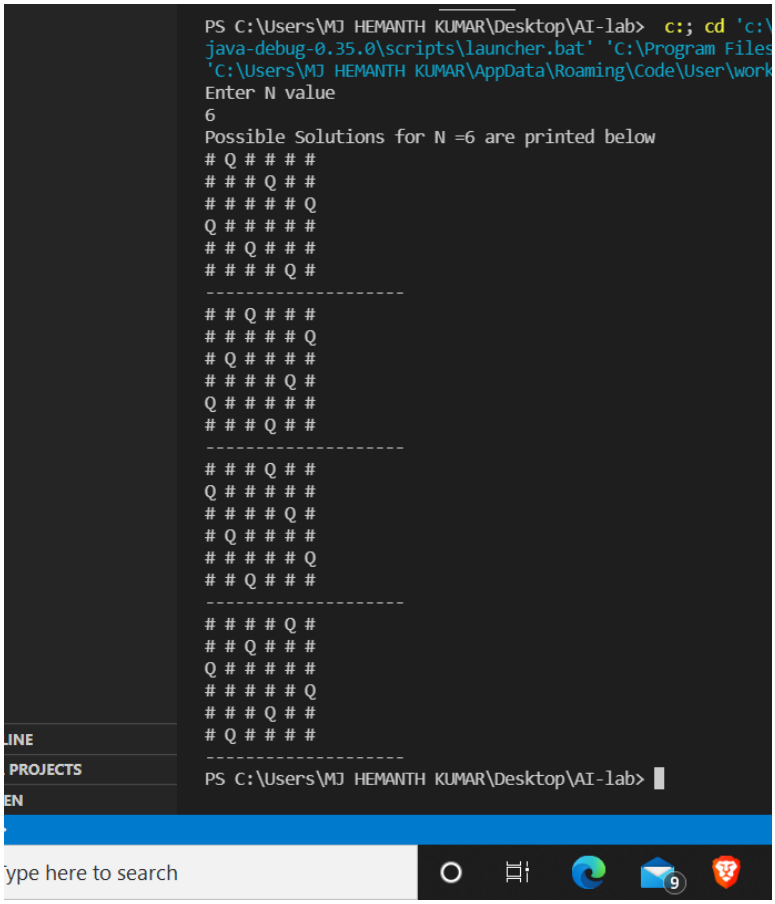
```
import java.util.Scanner;
public class lab2{



    public static void main(String [] args){
        Scanner sc=new Scanner(System.in);
        System.out.println("Enter N value ");
        int n=sc.nextInt();
        if(n<4){
            System.out.println("Solutions are not possible for N = "+n);
            System.exit(0);
        }
        System.out.println("Possible Solutions for N ="+n+" are printed
below");
        char [][] board=new char[n][n];
        fillboard(board);
        solveNqueen(0,board);
    }
    public static void fillboard(char [][] board){
        for(int i=0;i<board.length;i++){
            for(int j=0;j<board[0].length;j++){
                board[i][j]='#';
            }
        }
    }
    public static void display(char [][] board){
        for(int i=0;i<board.length;i++){
            for(int j=0;j<board[0].length;j++){
                System.out.print(board[i][j]+" ");
            }
            System.out.println();
        }
```

```
        System.out.println("--------------------");
    }
    public static void solveNqueen(int r,char [][] board){
        if(r==board.length){
            display(board);
            return;
        }
        for(int c=0;c<board[0].length;c++){

             if(isSafe(r,c,board)){
             board[r][c]='Q';
             solveNqueen(r+1, board);
             board[r][c]='#';
            }
        }
    }

    public static boolean isSafe(int r,int c,char [][] board){

        for(int i=r,j=c;i>=0 && j>=0;i--,j--){
            if(board[i][j]=='Q'){
                return false;
            }
        }

        for(int i=r;i>=0;i--){
            if(board[i][c]=='Q'){
                return false;
            }
        }
        for(int i=r,j=c;i>=0 && j<board[0].length;i--,j++){
            if(board[i][j]=='Q'){
                return false;
            }
        }

        return true;

    }
}
```

Output below :






PS C:\Users\MJ HEMANTH KUMAR\Desktop\AI-lab> c:; cd 'c:\
java-debug-0.35.0\scripts\launcher.bat' 'C:\Program Files
'C:\Users\MJ HEMANTH KUMAR\AppData\Roaming\Code\User\work
Enter N value
6
Possible Solutions for N =6 are printed below
Q # # #
Q #
Q
Q # # # # #
Q # #
Q

Q # #
Q
Q # # #
Q
Q # # # # #
Q #

Q #
Q # # # # #
Q
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Q
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Q
Q # #
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Q
Q #
Q # # #

PS C:\Users\MJ HEMANTH KUMAR\Desktop\AI-lab>
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