# ASSIGNMENT-4

**CODE:**

```
#include<bits/stdc++.h>
using namespace std;

bool checkSafety(vector<vector<int>> &b,int r,int n,int c){
    // traversing the row where the current queen is to be placed to
check for conflicting queen
    for(int i=0;i<c;i++){
        if(b[r][i]==1){
            return false;
        }
    }
    int r1=r,c1=c;
    // traversing top left diagonal
    while(r1!=-1 && c1!=-1){
        if(b[r1][c1]==1){
            return false;
        }
        --r1;
        --c1;
    }
    // traversing bottom left diagonal
    r1=r;
    c1=c;
    while(r1<n && c1!=-1){
        if(b[r1][c1]==1){
            return false;
        }
        ++r1;
        --c1;
    }
    return true;// no conflicting queen present
}

bool NQueens(vector<vector<int>> &b,int c,int n){
    if(c==n){
        return true;
    }
    for(int i=0;i<n;i++){
        if(checkSafety(b,i,n,c)){
            b[i][c]=1;
            if(NQueens(b,c+1,n)){
                return true;
            }
            b[i][c]=0;
```

```
        }
    }
    return false;
}

int main(){
    int n;
    while(true){
        cout<<"\nEnter number of queens: ";
        cin>>n;
        if(n==-1){
            cout<<"\nThank You.....";
            return 1;
        }
        vector<vector<int>> b;
        for(int i=0;i<n;i++){
            vector<int> x;
            for(int j=0;j<n;j++){
                x.push_back(0);
            }
            b.push_back(x);
        }
        if(NQueens(b,0,n)){
            cout<<"\n";
            for(int i=0;i<n;i++){
                for(int j=0;j<n;j++){
                    if(b[i][j]==1){
                        cout<<"Q ";
                    }
                    else{
                        cout<<". ";
                    }
                }
                cout<<"\n";
            }
        }
        else{
            cout<<"\nSolution not possible\n";
        }
        cout<<"\nEnter -1 to exit...\n";
    }
    return 0;
}
```

**OUTPUT:**

```
Enter number of queens: 2

Solution not possible

Enter -1 to exit...

Enter number of queens: 4

. . Q .
Q . . .
. . . Q
. Q . .

Enter -1 to exit...

Enter number of queens: 5

Q . . . .
. . . Q .
. Q . . .
. . . . Q
. . Q . .

Enter -1 to exit...

Enter number of queens: -1

Thank You.....
```