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Q) Implement N Queens Problem using backtracking.

Code:

```
#include <iostream>
#include <string>
#include <vector>
using namespace std;

class Solution {
public:
    bool isSafe(int row, int col, vector<string>& board, int n) {
        // Check Upper Diagonal
        int currrow = row;
        int currcol = col;

        while (row >= 0 && col >= 0) {
            if (board[row][col] == 'Q')
                return false;
            row--;
            col--;
        }

        row = currrow;
        col = currcol;

        // Check for rows
        while (col >= 0) {
            if (board[row][col] == 'Q')
                return false;
            col--;
        }

        row = currrow;
        col = currcol;

        // Check Lower Diagonal
        while (row < n && col >= 0) {
            if (board[row][col] == 'Q')
                return false;
```

```
            row++;
            col--;
        }

        return true;
    }

    void solve(int col, vector<string>& board, vector<vector<string>>& ans,
int n) {
        if (col == n) {
            ans.push_back(board);
            return;
        }

        for (int row = 0; row < n; row++) {
            if (isSafe(row, col, board, n)) {
                board[row][col] = 'Q';
                solve(col + 1, board, ans, n);
                board[row][col] = '.';
            }
        }
    }

    vector<vector<string>> solveNQueens(int n) {
        vector<string> board(n, string(n, '.'));

        vector<vector<string>> ans;

        solve(0, board, ans, n);

        return ans;
    }
};

void printChessboard(const vector<string>& board) {
    for (const string& row : board) {
        cout <<  row  << endl;
    }
    cout << endl;
}

int main() {
    cout << "Enter Size of Grid: ";
    int n;
    cin >> n;

    Solution solution;
    vector<vector<string>> result = solution.solveNQueens(n);
```

```
    // Printing the result
    for (const vector<string>& board : result) {
        printChessboard(board);
    }

    return 0;
}
```

Output:

```
Enter Size of Grid: 4
..Q.
Q...
...Q
.Q..

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

PS C:\Users\sheeh\OneDrive\Desktop\Cppprgming>
```