Question 1 leetcode-:

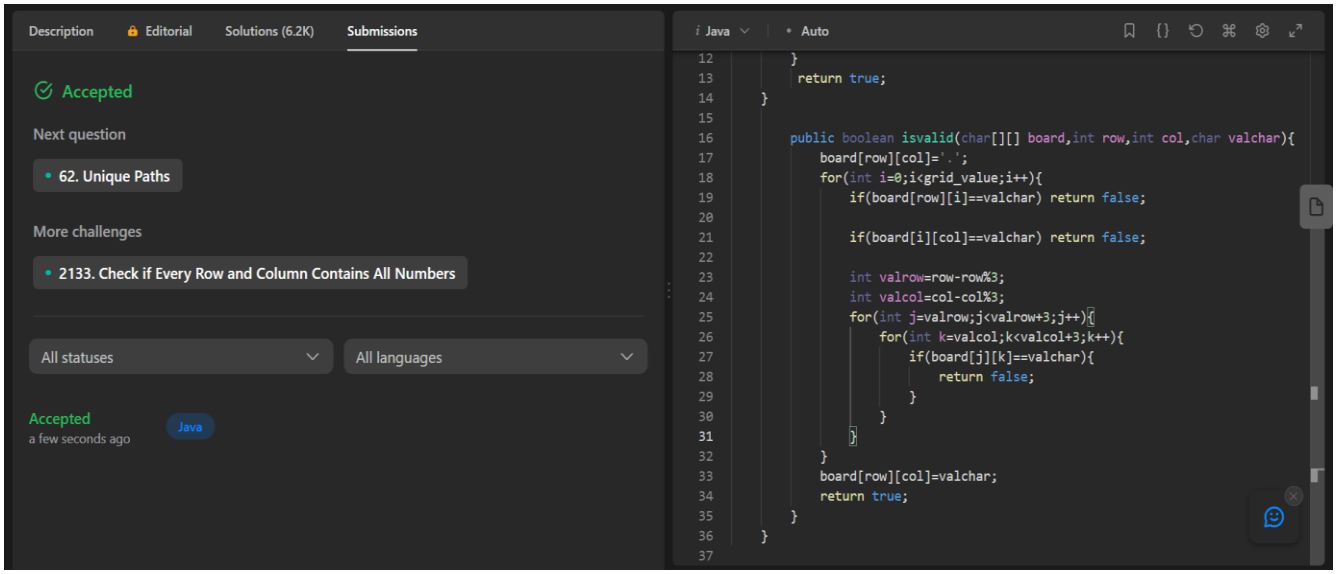
Valid sudoku:

```
class Solution {
    int grid_value=9;
    public boolean isValidSudoku(char[][] board) {
        for(int i=0;i<grid_value;i++){
            for(int j=0;j<grid_value;j++){
                if(board[i][j]!='.'){
                if(!isvalid(board,i,j,board[i][j])){
                    return false;
                }
                }
            }
        }
         return true;
    }

        public boolean isvalid(char[][] board,int row,int col,char valchar){
            board[row][col]='.';
            for(int i=0;i<grid_value;i++){
                if(board[row][i]==valchar) return false;

                if(board[i][col]==valchar) return false;

                int valrow=row-row%3;
                int valcol=col-col%3;
                for(int j=valrow;j<valrow+3;j++){
                    for(int k=valcol;k<valcol+3;k++){
                        if(board[j][k]==valchar){
                            return false;
                        }
                    }
                }
            }
            board[row][col]=valchar;
            return true;
        }
    }
```



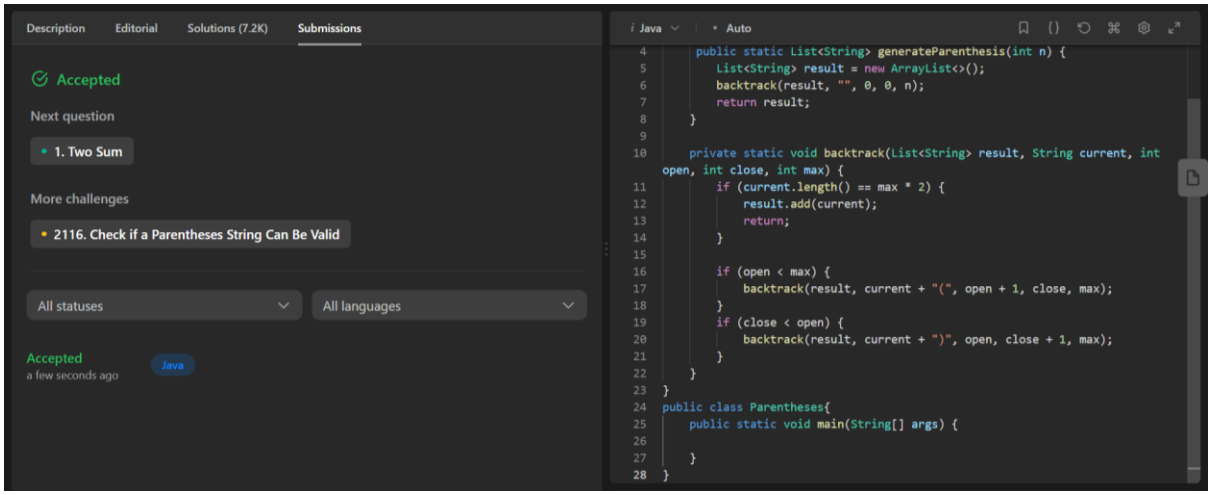

Question 2:

```java
import java.util.List;
import java.util.ArrayList;
class Solution {
     public static List<String> generateParenthesis(int n) {
        List<String> result = new ArrayList<>();
        backtrack(result, "", 0, 0, n);
        return result;
    }

    private static void backtrack(List<String> result, String current, int open,
int close, int max) {
        if (current.length() == max * 2) {
            result.add(current);
            return;
        }

        if (open < max) {
            backtrack(result, current + "(", open + 1, close, max);
        }
        if (close < open) {
            backtrack(result, current + ")", open, close + 1, max);
        }
    }
}
public class Parentheses{
    public static void main(String[] args) {

    }
}
```

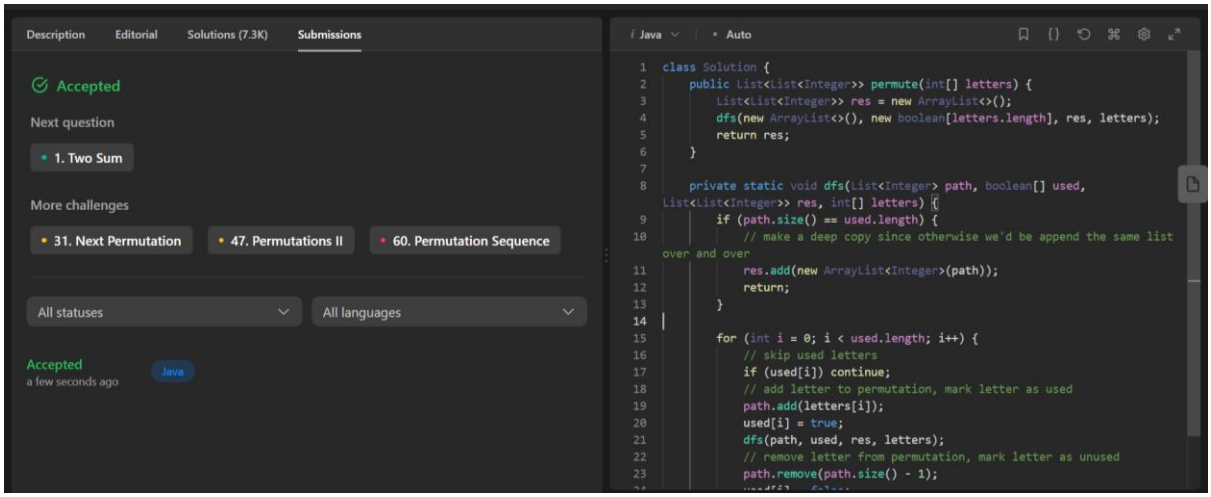



Question 3:

```java
class Solution {
    public List<List<Integer>> permute(int[] letters) {
        List<List<Integer>> res = new ArrayList<>();
        dfs(new ArrayList<>(), new boolean[letters.length], res, letters);
        return res;
    }

    private static void dfs(List<Integer> path, boolean[] used,
List<List<Integer>> res, int[] letters) {
        if (path.size() == used.length) {
            // make a deep copy since otherwise we'd be append the same list over
and over
            res.add(new ArrayList<Integer>(path));
            return;
        }

        for (int i = 0; i < used.length; i++) {
            // skip used letters
            if (used[i]) continue;
            // add letter to permutation, mark letter as used
            path.add(letters[i]);
            used[i] = true;
            dfs(path, used, res, letters);
            // remove letter from permutation, mark letter as unused
            path.remove(path.size() - 1);
            used[i] = false;
        }
    }
}
```




Question 4:

```
public class RatInAMaze {
    public static void main(String[] args) {
        int[][] maze = {
            {1, 0, 0, 0},
            {1, 1, 0, 1},
            {0, 1, 0, 0},
            {1, 1, 1, 1}
        };

        solveMaze(maze);
    }

    public static void solveMaze(int[][] maze) {
        int rows = maze.length;
        int columns = maze[0].length;
        int[][] solution = new int[rows][columns];

        if (solveMazeUtil(maze, 0, 0, solution)) {
            printSolution(solution);
        } else {
            System.out.println("No solution exists.");
```

```
    }
}

private static boolean solveMazeUtil(int[][] maze, int row, int col, int[][] solution) {
    int rows = maze.length;
    int columns = maze[0].length;

    if (row >= 0 && row < rows && col >= 0 && col < columns && maze[row][col] == 1) {
        solution[row][col] = 1;
        if (row == rows - 1 && col == columns - 1) {
            return true;
        }
        if (solveMazeUtil(maze, row, col + 1, solution)) {
            return true;
        }
        if (solveMazeUtil(maze, row + 1, col, solution)) {
            return true;
        }
        if (solveMazeUtil(maze, row - 1, col, solution)) {
            return true;
        }
        if (solveMazeUtil(maze, row, col - 1, solution)) {
            return true;
        }
        solution[row][col] = 0;
        return false;
    }

    return false;
}
```

```
    private static void printSolution(int[][] solution) {
        int rows = solution.length;
        int columns = solution[0].length;

        for (int i = 0; i < rows; i++) {
            for (int j = 0; j < columns; j++) {
                System.out.print(solution[i][j] + " ");
            }
            System.out.println();
        }
    }
}
```


Question 5:

```java
class Solution {
    public boolean exist(char[][] board, String word) {
        boolean result=false;
        int m=board.length;
        int n=board[0].length;
        for(int i=0;i<m;i++){
            for(int j=0;j<n;j++){
                if(search(board,word,i,j,0)){
                    return true;
                }
            }
        }
        return result;
```

```
    }
    private boolean search(char [][] board,String word,int row,int col,int k){
        int m=board.length;
        int n=board[0].length;
        //if length exceed
        if(row<0 || col<0 || row>=m || col>=n ){
            return false;
        }
        if(board[row][col]==word.charAt(k)){
            char temp=board[row][col];
            board[row][col]='#';
            if(k==word.length()-1){
                return true;
            }

        else if(search(board,word,row-1,col,k+1) || search(board,word,row,col-
1,k+1) || search(board,word,row+1,col,k+1) || search(board,word,row,col+1,k+1)){
            return true;
        }
        board[row][col]=temp;
        }
        return false;
    }
}
```