Fast Learner Complex Problems

Student Name: Kumar Arun

UID: 22BCS50204

Branch: CSE

Section/Group: NTPP-603-B

Semester: 6th

Date of Performance: 31/03/25

Subject Name: AP-2

Subject Code: 22CSP-351

Aim(i): *Set Matrix Zeroes: Given an m x n matrix, if an element is 0, set its entire row and column to 0.*

Source Code:

```
class Solution {
public:
    void setZeroes(vector<vector<int>>& matrix) {
        int rows = matrix.size();
        int cols = matrix[0].size();

        bool firstRowHasZero = false;
        bool firstColHasZero = false;

        // Check if the first row contains zero
        for (int c = 0; c < cols; c++) {
            if (matrix[0][c] == 0) {
                firstRowHasZero = true;
                break;
            }
        }

        // Check if the first column contains zero
        for (int r = 0; r < rows; r++) {
            if (matrix[r][0] == 0) {
                firstColHasZero = true;
                break;
```

```
            }
        }

        // Use the first row and column as markers
        for (int r = 1; r < rows; r++) {
            for (int c = 1; c < cols; c++) {
                if (matrix[r][c] == 0) {
                    matrix[r][0] = 0;
                    matrix[0][c] = 0;
                }
            }
        }

        // Set the marked rows to zero
        for (int r = 1; r < rows; r++) {
            if (matrix[r][0] == 0) {
                for (int c = 1; c < cols; c++) {
                    matrix[r][c] = 0;
                }
            }
        }

        // Set the marked columns to zero
        for (int c = 1; c < cols; c++) {
            if (matrix[0][c] == 0) {
                for (int r = 1; r < rows; r++) {
                    matrix[r][c] = 0;
                }
            }
        }

        // Set the first row to zero if needed
        if (firstRowHasZero) {
            for (int c = 0; c < cols; c++) {
                matrix[0][c] = 0;
            }
        }

        // Set the first column to zero if needed
        if (firstColHasZero) {
            for (int r = 0; r < rows; r++) {
                matrix[r][0] = 0;
            }
        }
    }
};
```

OUTPUT:

Accepted Runtime: 0 ms

• Case 1 • Case 2

Input

matrix =

```
[[1,1,1],[1,0,1],[1,1,1]]
```

Output

```
[[1,0,1],[0,0,0],[1,0,1]]
```

Expected

```
[[1,0,1],[0,0,0],[1,0,1]]
```

Contribute a testcase

Accepted Runtime: 0 ms

• Case 1 • Case 2

Input

matrix =

```
[[0,1,2,0],[3,4,5,2],[1,3,1,5]]
```

Output

```
[[0,0,0,0],[0,4,5,0],[0,3,1,0]]
```

Expected

```
[[0,0,0,0],[0,4,5,0],[0,3,1,0]]
```

Accepted 202 / 202 testcases passed

Meenansh_16380 submitted at Mar 31, 2025 16:14

Runtime

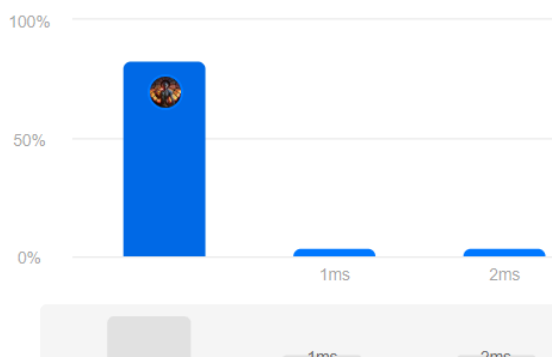
0 ms | Beats 100.00%

Analyze Complexity

Me

18.6

Ar



Aim(v): *The Skyline Problem: Given a list of buildings represented as [left, right, height], where each building is a rectangle, return the key points of the skyline. A key point is represented as [x, y], where x is the xcoordinate where the height changes to y.*

Source Code:

```
class Solution {
public:
    vector<vector<int>> getSkyline(vector<vector<int>>& buildings) {
        vector<pair<int,int>>line;
        for(auto it:buildings){
            line.push_back({it[0],-it[2]});
            line.push_back({it[1],it[2]});
        }
        sort(line.begin(),line.end(),[&](pair<int,int>&a,pair<int,int>&b){
            if(a.first==b.first){
                return a.second<b.second;
            }
            return a.first<b.first;
        });
        multiset<int>st;
        vector<vector<int>>res;
        int curr=0;
        for(auto it:line){
            int ht=it.second;
            if(ht<0){
                st.insert(-1*ht);
            }else if(ht>=0){
                st.erase(st.find(ht));
            }
            int new_ht=st.empty()?0:*st.rbegin();
            if(new_ht!=curr){
                curr=new_ht;
                res.push_back({it.first,new_ht});
            }
        }
        return res;
    }
};
```

OUTPUT:

Accepted Runtime: 0 ms

• Case 1 • Case 2

Input

buildings =

[[0,2,3],[2,5,3]]

Output

[[0,3],[5,0]]

Expected

[[0,3],[5,0]]

Accepted Runtime: 0 ms

• Case 1 • Case 2

Input

buildings =

[[2,9,10],[3,7,15],[5,12,12],[15,20,10],[19,24,8]]

Output

[[2,10],[3,15],[7,12],[12,0],[15,10],[20,8],[24,0]]

Expected

[[2,10],[3,15],[7,12],[12,0],[15,10],[20,8],[24,0]]

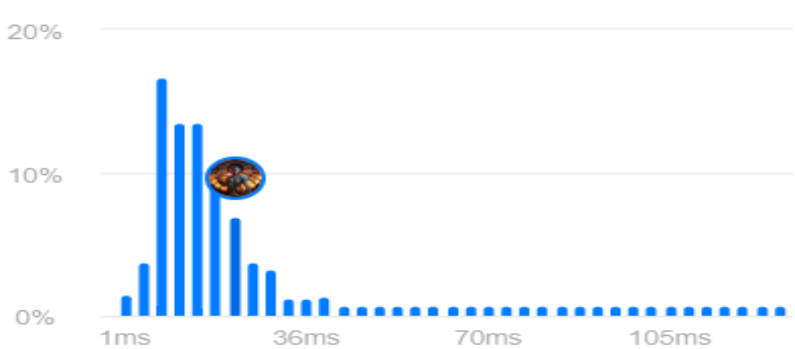
Accepted 44 / 44 testcases passed

Meenansh_16380 submitted at Mar 31, 2025 16:28

Runtime

24 ms | Beats 35.39%

Analyze Complexity



Aim(vi): *Longest Increasing Subsequence II: Given an integer array nums, find the length of the longest strictly increasing subsequence. A subsequence is derived from the array by deleting some or no elements without changing the order of the remaining elements.*

Source Code:

```
class Solution {
public:
    int lengthOfLIS(vector<int>& nums) {
        vector<int> res;

        for (int n : nums) {
            if (res.empty() || res.back() < n) {
                res.push_back(n);
            } else {
                int idx = binarySearch(res, n);
                res[idx] = n;
            }
        }

        return res.size();
    }

private:
    int binarySearch(const vector<int>& arr, int target) {
        int left = 0;
        int right = arr.size() - 1;

        while (left <= right) {
            int mid = (left + right) / 2;
            if (arr[mid] == target) {
                return mid;
            } else if (arr[mid] > target) {
                right = mid - 1;
            } else {
                left = mid + 1;
            }
        }

        return left;
    }
};
```

OUTPUT:

Accepted Runtime: 0 ms

• Case 1 • Case 2

Input

nums =

[10,9,2,5,3,7,101,18]

Output

4

Expected

4

Accepted Runtime: 0 ms

• Case 1 • Case 2

Input

nums =

[0,1,0,3,2,3]

Output

4

Expected

4

Accepted 55 / 55 testcases passed

Meenansh_16380 submitted at Mar 31, 2025 16:31

Editorial Solution

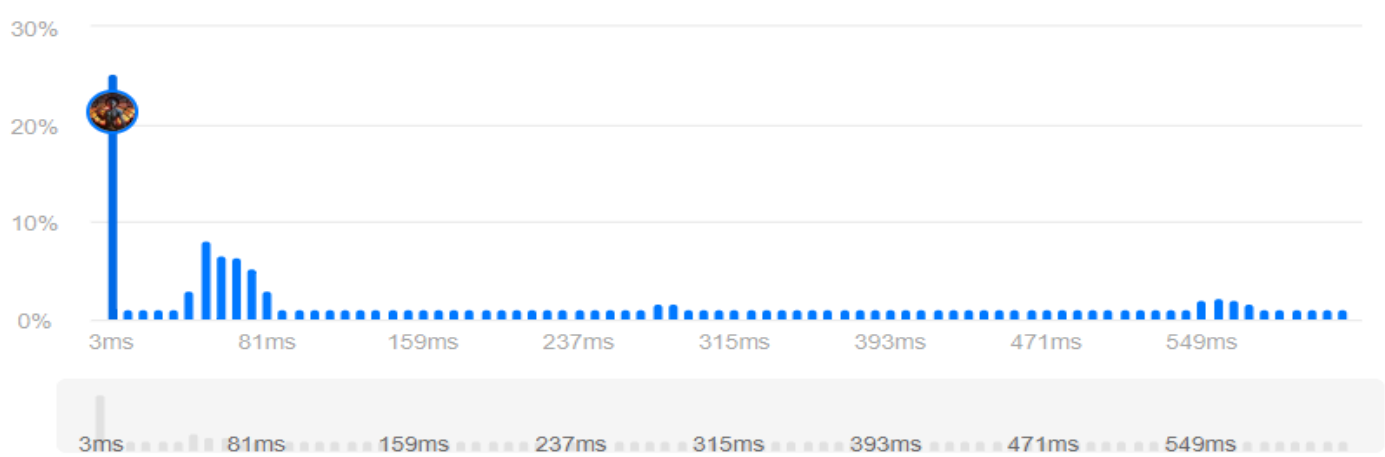
Runtime

4 ms | Beats 77.46%

Analyze Complexity

Memory

13.92 MB | Beats 94.26%



Aim(vii): *Search a 2D Matrix II: Given an m x n matrix where each row is sorted in ascending order from left to right and each column is sorted in ascending order from top to bottom, and an integer target, determine if the target exists in the matrix.*

Source Code:

```
class Solution {
public:
    bool searchMatrix(vector<vector<int>>& matrix, int target) {
        int m = matrix.size(), n = m ? matrix[0].size() : 0, r = 0, c = n - 1;
        while (r < m && c >= 0) {
            if (matrix[r][c] == target) {
                return true;
            }
            matrix[r][c] > target ? c-- : r++;
        }
        return false;
    }
};
```

OUTPUT:

Accepted Runtime: 3 ms

• Case 1 • Case 2

Input

matrix =
[[1,4,7,11,15],[2,5,8,12,19],[3,6,9,16,22],[10,13,14,17,24],[18,21,23,26,30]]

target =
5

Output

true

Expected

true

Accepted Runtime: 3 ms

• Case 1 • Case 2

Input

matrix =
[[1,4,7,11,15],[2,5,8,12,19],[3,6,9,16,22],[10,13,14,17,24],[18,21,23,26,30]]

target =
20

Output

false

Expected

false

Aim(viii): *Word Break: Given a string s and a dictionary wordDict containing a list of words, determine if s can be segmented into a space-separated sequence of one or more dictionary words. The same word can be reused multiple times.*

Source Code:

```
class Solution {
public:
    bool wordBreak(string s, vector<string>& wordDict) {
        vector<bool> dp(s.size() + 1, false);
        dp[0] = true;

        for (int i = 1; i <= s.size(); i++) {
            for (const string& w : wordDict) {
                int start = i - w.length();
                if (start >= 0 && dp[start] && s.substr(start, w.length()) == w) {
                    dp[i] = true;
                    break;
                }
            }
        }
        return dp[s.size()];
    }
};
```

OUTPUT:

Accepted Runtime: 0 ms

• Case 1 • Case 2 • Case 3

Input

s =
"leetcode"

wordDict =
["leet","code"]

Output

true

Expected

true

Accepted Runtime: 0 ms

• Case 1 • Case 2 • Case 3

Input

s =
"applepenapple"

wordDict =
["apple","pen"]

Output

true

Expected

true