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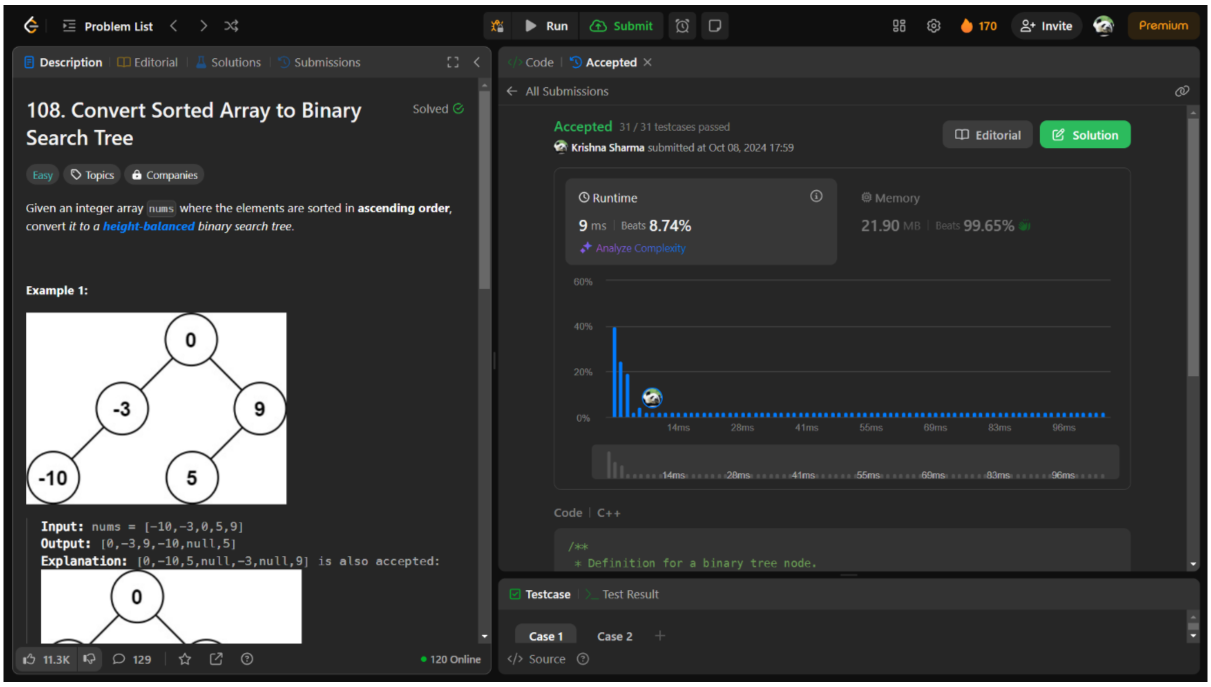
Section: FL_IOT-602 / A

Convert Sorted Array to Binary Search Tree

```
class Solution {
public:
    TreeNode* helper(int left, int right, vector<int>& nums) {
        if(left > right) return nullptr;
        int mid = left+(right-left)/2;
        TreeNode* root = new TreeNode(nums[mid]);
        root->left = helper(left, mid-1, nums);
        root->right = helper(mid+1, right, nums);
        return root;
    }
    TreeNode* sortedArrayToBST(vector<int>& nums) {
        int n = nums.size()-1;
        return helper(0, n, nums);
    }
};
```



108. Convert Sorted Array to Binary Search Tree

Given an integer array `nums` where the elements are sorted in **ascending order**, convert *it to a* ***height-balanced*** *binary search tree.*

Example 1:

```
Input: nums = [-10,-3,0,5,9]
Output: [0,-3,9,-10,null,5]
Explanation: [0,-10,5,null,-3,null,9] is also accepted:
```

Accepted 31 / 31 testcases passed

Krishna Sharma submitted at Oct 08, 2024 17:59

Runtime

9 ms | Beats 8.74%

Memory

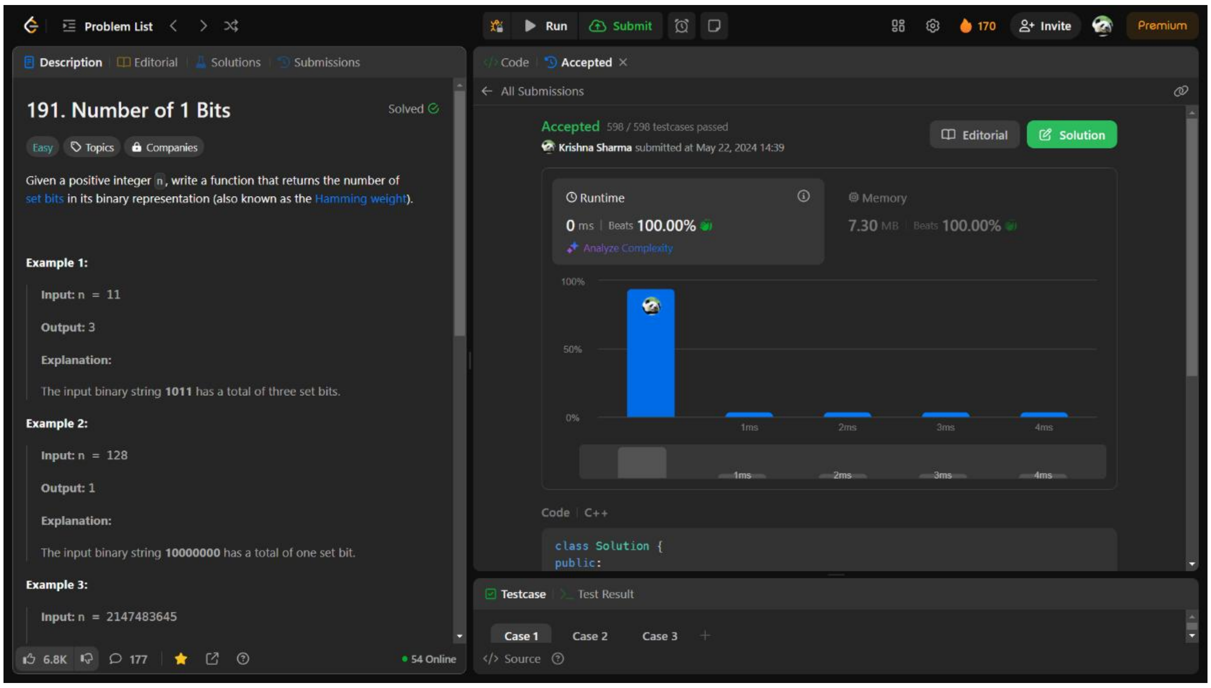
21.90 MB | Beats 99.65%

Code | C++

```
/**
 * Definition for a binary tree node.
```

Number of 1 Bits

```
class Solution {
public:
    int hammingWeight(int n) {
        int count = 0;
        while(n) {
            if((n&1) == 1) count++;
            n >>= 1;
        }
        return count;
    }
};
```



Problem List

Description | Editorial | Solutions | Submissions

191. Number of 1 Bits

Solved

Easy | Topics | Companies

Given a positive integer `n`, write a function that returns the number of set bits in its binary representation (also known as the Hamming weight).

Example 1:

Input: n = 11

Output: 3

Explanation:

The input binary string **1011** has a total of three set bits.

Example 2:

Input: n = 128

Output: 1

Explanation:

The input binary string **10000000** has a total of one set bit.

Example 3:

Input: n = 2147483645

6.8K | 177 | 54 Online

Run | Submit | 170 | Invite | Premium

Code | Accepted

All Submissions

Accepted 598 / 598 testcases passed

Krishna Sharma submitted at May 22, 2024 14:39

Editorial | Solution

Runtime

0 ms | Beats 100.00%

Analyze Complexity

Memory

7.30 MB | Beats 100.00%

Code | C++

```
class Solution {
public:
```

Testcase | Test Result

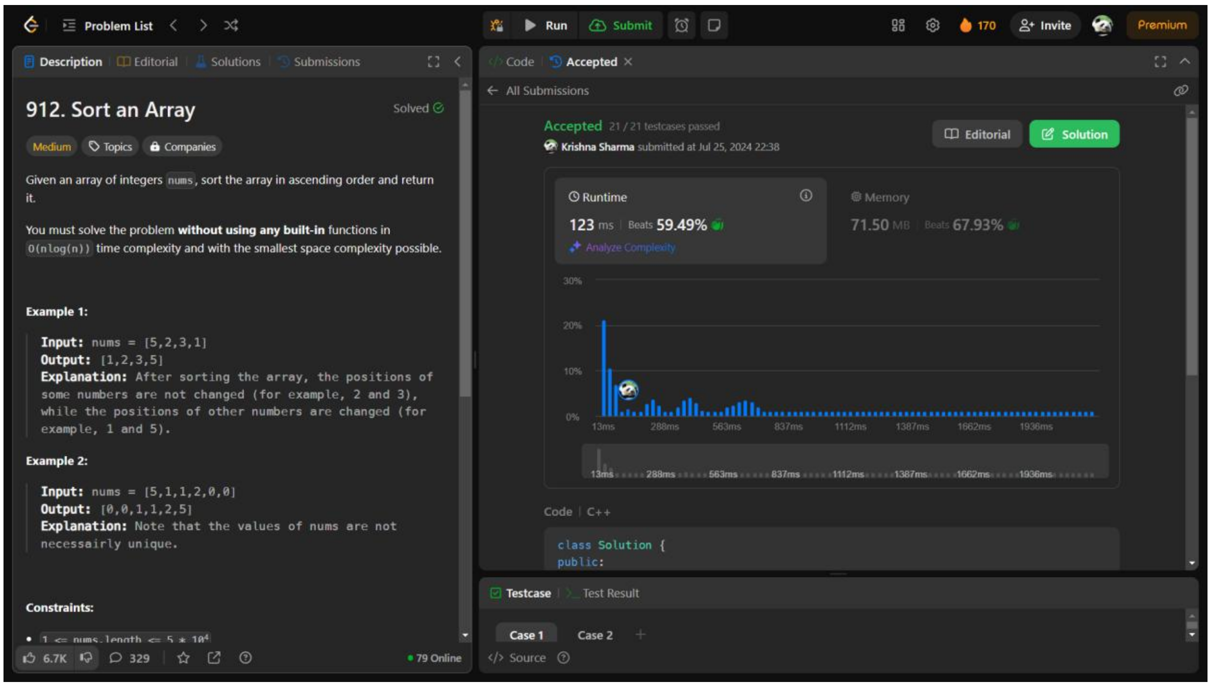
Case 1 | Case 2 | Case 3

Source

Sort an Array

```
class Solution {
public:
    void merge(vector<int>& A, int start, int mid, int end, vector<int>& buff) {
        int left=start, right=mid+1;
        int s=end-start+1;
        for(int i=0; i<s; i++) {
            int i0=start+i;
            if(left>mid){
                buff[i0]=A[right];
                right++;
            } else if (right>end){
```

```
        buff[i0]=A[left];
        left++;
      } else  if (A[left]<A[right]) {
        buff[i0]=A[left];
        left++;
      } else {
        buff[i0]=A[right];
        right++;
      }
    }
    for(int i=start; i<start+s; i++) A[i]=buff[i];
  }
  void mergeSort(vector<int>& A, int start, int end, vector<int>& buff ) {
    if(end<=start) return;
    int mid=start+(end-start)/2;
    mergeSort(A, start, mid, buff);
    mergeSort(A, mid+1, end, buff);
    merge(A, start, mid, end, buff);
  }
  vector<int> sortArray(vector<int>& nums) {
    vector<int> buff(nums.size());
    mergeSort(nums, 0, nums.size()-1 ,buff);
    return nums;
  }
};
```



912. Sort an Array

Solved

Medium Topics Companies

Given an array of integers `nums`, sort the array in ascending order and return it.

You must solve the problem **without using any built-in** functions in `O(nlog(n))` time complexity and with the smallest space complexity possible.

Example 1:

```
Input: nums = [5,2,3,1]
Output: [1,2,3,5]
Explanation: After sorting the array, the positions of
some numbers are not changed (for example, 2 and 3),
while the positions of other numbers are changed (for
example, 1 and 5).
```

Example 2:

```
Input: nums = [5,1,1,2,0,0]
Output: [0,0,1,1,2,5]
Explanation: Note that the values of nums are not
necessairly unique.
```

Constraints:

- `1 <= nums.length <= 5 * 10^4`

Accepted 21 / 21 testcases passed

Krishna Sharma submitted at Jul 25, 2024 22:38

Runtime
123 ms | Beats 59.49%

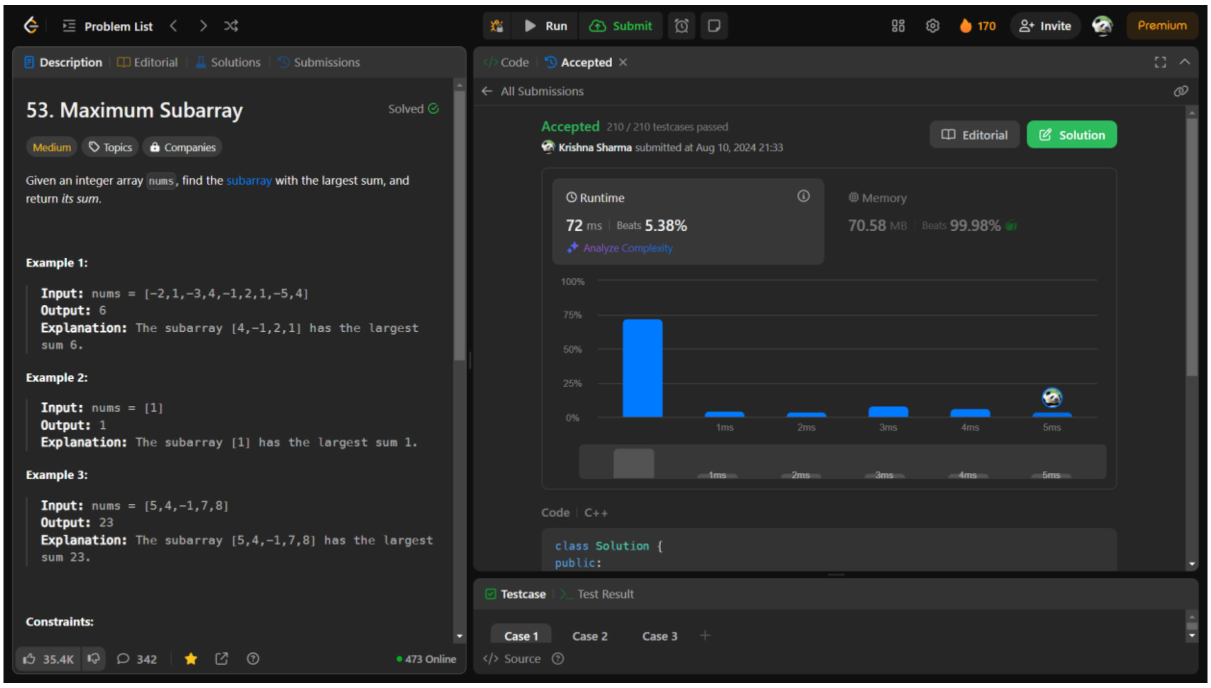
Memory
71.50 MB | Beats 67.93%

Code | C++

```
class Solution {
public:
```

Maximum Subarray

```
class Solution {
public:
    int maxSubArray(vector<int>& nums) {
        int ans = INT_MIN;
        int currSum = 0;
        for(int i=0;i<nums.size();i++) {
            currSum += nums[i];
            if(currSum > ans) ans = currSum;
            if(currSum < 0) currSum = 0;
        }
        return ans;
    }
};
```



53. Maximum Subarray

Solved

Medium · Topics · Companies

Given an integer array `nums`, find the subarray with the largest sum, and return *its sum*.

Example 1:

```
Input: nums = [-2,1,-3,4,-1,2,1,-5,4]
Output: 6
Explanation: The subarray [4,-1,2,1] has the largest
sum 6.
```

Example 2:

```
Input: nums = [1]
Output: 1
Explanation: The subarray [1] has the largest sum 1.
```

Example 3:

```
Input: nums = [5,4,-1,7,8]
Output: 23
Explanation: The subarray [5,4,-1,7,8] has the largest
sum 23.
```

Constraints:

Accepted 210 / 210 testcases passed

Krishna Sharma submitted at Aug 10, 2024 21:33

Runtime
72 ms | Beats 5.38%

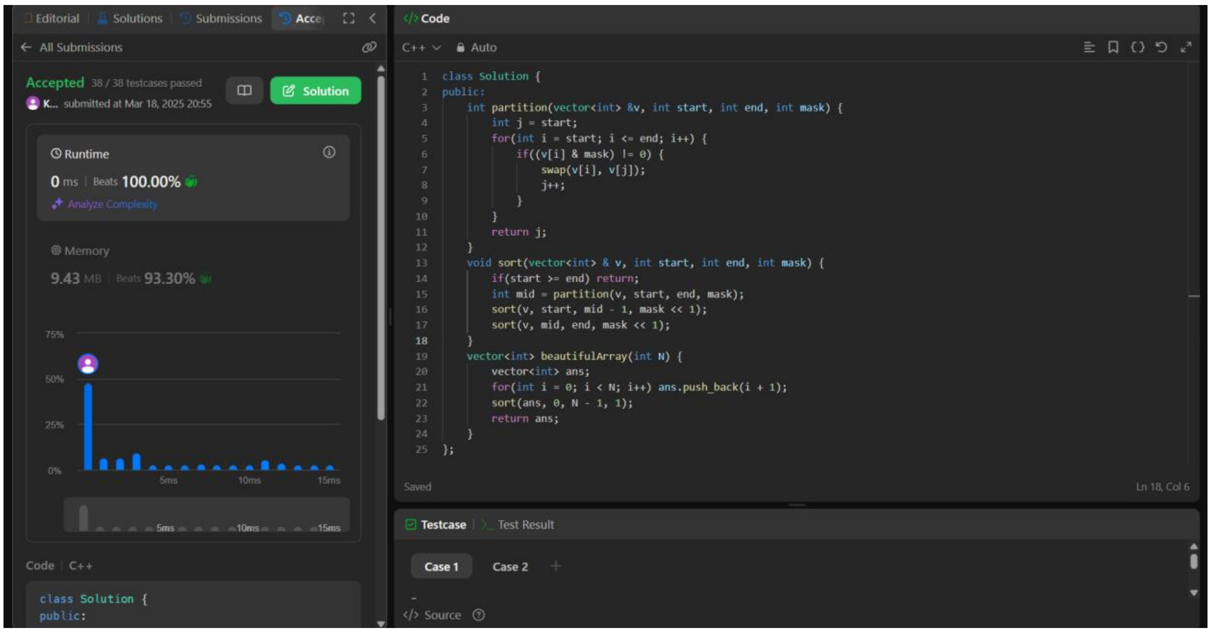
Memory
70.58 MB | Beats 99.98%

Code | C++

```
class Solution {
public:
```

Beautiful Array

```
class Solution {
public:
    int partition(vector<int> &v, int start, int end, int mask) {
        int j = start;
        for(int i = start; i <= end; i++) {
            if((v[i] & mask) != 0) {
                swap(v[i], v[j]);
                j++;
            }
        }
        return j;
    }
    void sort(vector<int> & v, int start, int end, int mask) {
        if(start >= end) return;
        int mid = partition(v, start, end, mask);
        sort(v, start, mid - 1, mask << 1);
        sort(v, mid, end, mask << 1);
    }
    vector<int> beautifulArray(int N) {
        vector<int> ans;
        for(int i = 0; i < N; i++) ans.push_back(i + 1);
        sort(ans, 0, N - 1, 1);
        return ans;
    }
};
```



Accepted 38 / 38 testcases passed
K... submitted at Mar 18, 2025 20:55

Runtime
0 ms | Beats 100.00%

Memory
9.43 MB | Beats 93.30%

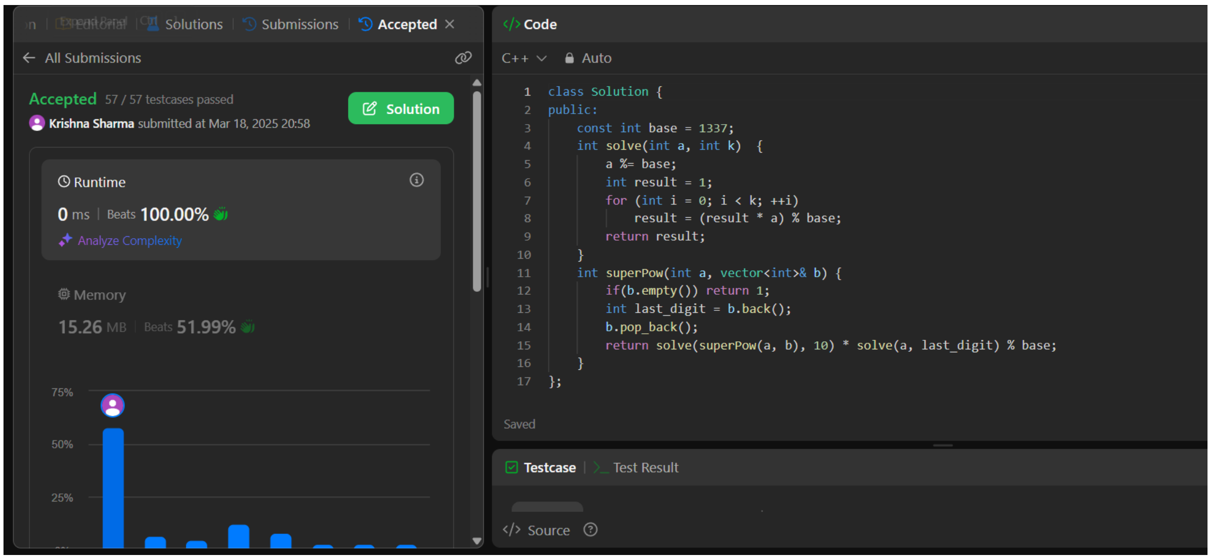
Code | C++

```
class Solution {
public:
    int partition(vector<int> &v, int start, int end, int mask) {
        int j = start;
        for(int i = start; i <= end; i++) {
            if((v[i] & mask) != 0) {
                swap(v[i], v[j]);
                j++;
            }
        }
        return j;
    }
    void sort(vector<int> & v, int start, int end, int mask) {
        if(start >= end) return;
        int mid = partition(v, start, end, mask);
        sort(v, start, mid - 1, mask << 1);
        sort(v, mid, end, mask << 1);
    }
    vector<int> beautifulArray(int N) {
        vector<int> ans;
        for(int i = 0; i < N; i++) ans.push_back(i + 1);
        sort(ans, 0, N - 1, 1);
        return ans;
    }
};
```

Saved
Ln 18, Col 6

Super Pow

```
class Solution {
public:
    const int base = 1337;
    int solve(int a, int k)  {
        a %= base;
        int result = 1;
        for (int i = 0; i < k; ++i)
            result = (result * a) % base;
        return result;
    }
    int superPow(int a, vector<int>& b) {
        if(b.empty()) return 1;
        int last_digit = b.back();
        b.pop_back();
        return solve(superPow(a, b), 10) * solve(a, last_digit) % base;
    }
};
```



Accepted 57 / 57 testcases passed
Krishna Sharma submitted at Mar 18, 2025 20:58

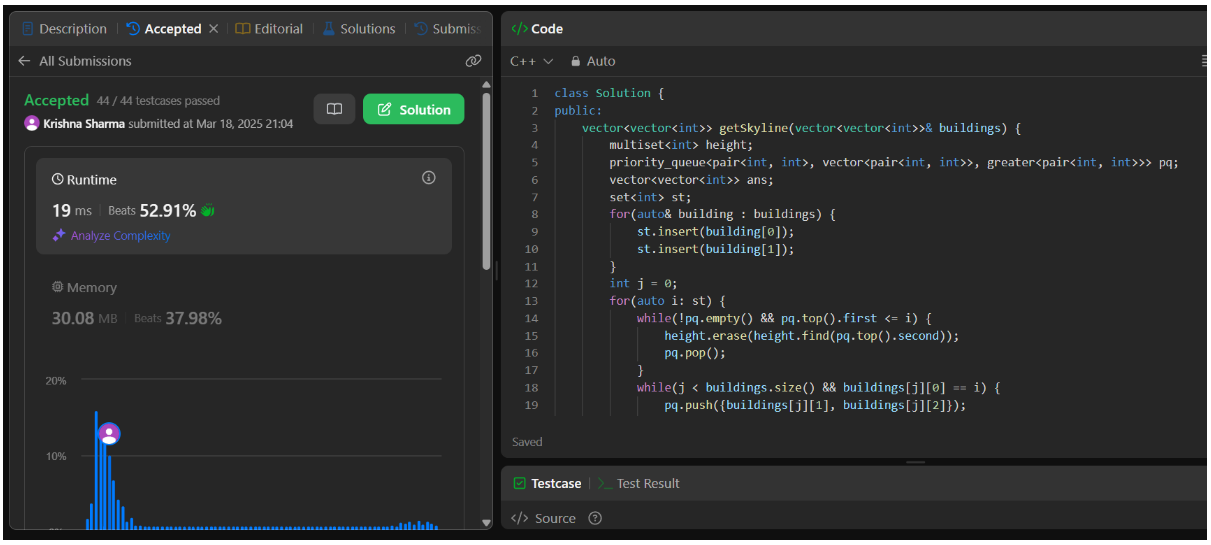
Runtime
0 ms | Beats 100.00%

Memory
15.26 MB | Beats 51.99%

```
class Solution {
public:
    const int base = 1337;
    int solve(int a, int k)  {
        a %= base;
        int result = 1;
        for (int i = 0; i < k; ++i)
            result = (result * a) % base;
        return result;
    }
    int superPow(int a, vector<int>& b) {
        if(b.empty()) return 1;
        int last_digit = b.back();
        b.pop_back();
        return solve(superPow(a, b), 10) * solve(a, last_digit) % base;
    }
};
```

The Skyline Problem

```
class Solution {
public:
    vector<vector<int>> getSkyline(vector<vector<int>>& buildings) {
        multiset<int> height;
        priority_queue<pair<int, int>, vector<pair<int, int>>, greater<pair<int, int>>> pq;
        vector<vector<int>> ans;
        set<int> st;
        for(auto& building : buildings) {
            st.insert(building[0]);
            st.insert(building[1]);
        }
        int j = 0;
        for(auto i: st) {
            while(!pq.empty() && pq.top().first <= i) {
                height.erase(height.find(pq.top().second));
                pq.pop();
            }
            while(j < buildings.size() && buildings[j][0] == i) {
                pq.push({buildings[j][1], buildings[j][2]});
                height.insert(buildings[j][2]);
                j++;
            }
            if(height.empty()) {
                if(ans.empty() || ans.back()[1] != 0)
                    ans.push_back({i, 0});
            } else {
                int maxHeight = *height.rbegin();
                if (ans.empty() || ans.back()[1] != maxHeight)
                    ans.push_back({i, maxHeight});
            }
        }
        return ans;
    }
};
```



Accepted 44 / 44 testcases passed

Krishna Sharma submitted at Mar 18, 2025 21:04

Runtime

19 ms | Beats 52.91%

Memory

30.08 MB | Beats 37.98%

C++ Auto

```
class Solution {
public:
    vector<vector<int>> getSkyline(vector<vector<int>>& buildings) {
        multiset<int> height;
        priority_queue<pair<int, int>, vector<pair<int, int>>, greater<pair<int, int>>> pq;
        vector<vector<int>> ans;
        set<int> st;
        for(auto& building : buildings) {
            st.insert(building[0]);
            st.insert(building[1]);
        }
        int j = 0;
        for(auto i: st) {
            while(!pq.empty() && pq.top().first <= i) {
                height.erase(height.find(pq.top().second));
                pq.pop();
            }
            while(j < buildings.size() && buildings[j][0] == i) {
                pq.push({buildings[j][1], buildings[j][2]});
```

Saved