Assignment 7

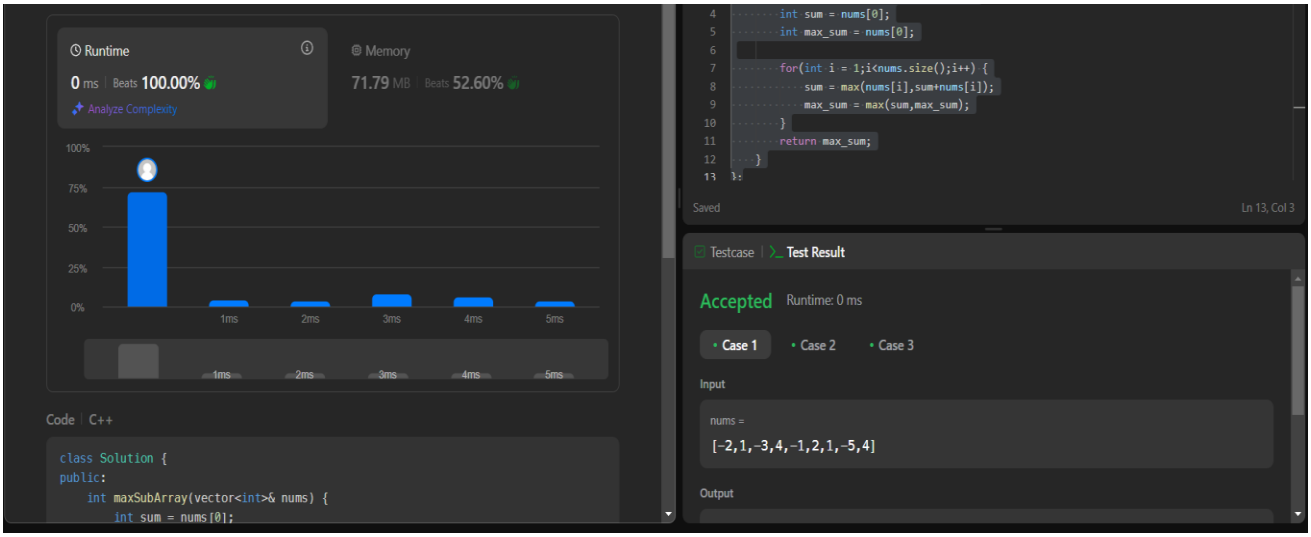
Student Name: Nikhil Kumar Tiwari
UID: 22BCS10471
Branch :BE-CSE
Section/Group:22BCS-IOT-FL-601 A
Semester: 6 th
Subject Code: 22CSP-351
Subject Name: Advanced Programming Lab- 2

Problem 1: Maximum Subarray (https://leetcode.com/problems/maximum-subarray/ **)**

Code:

```
class Solution {

public:

  int maxSubArray(vector<int>& nums) {

    int sum = nums[0];

    int max_sum = nums[0];


    for(int i = 1;i<nums.size();i++) {

      sum = max(nums[i],sum+nums[i]);

      max_sum = max(sum,max_sum);

    }

    return max_sum;

  }

};
```

Screenshot:

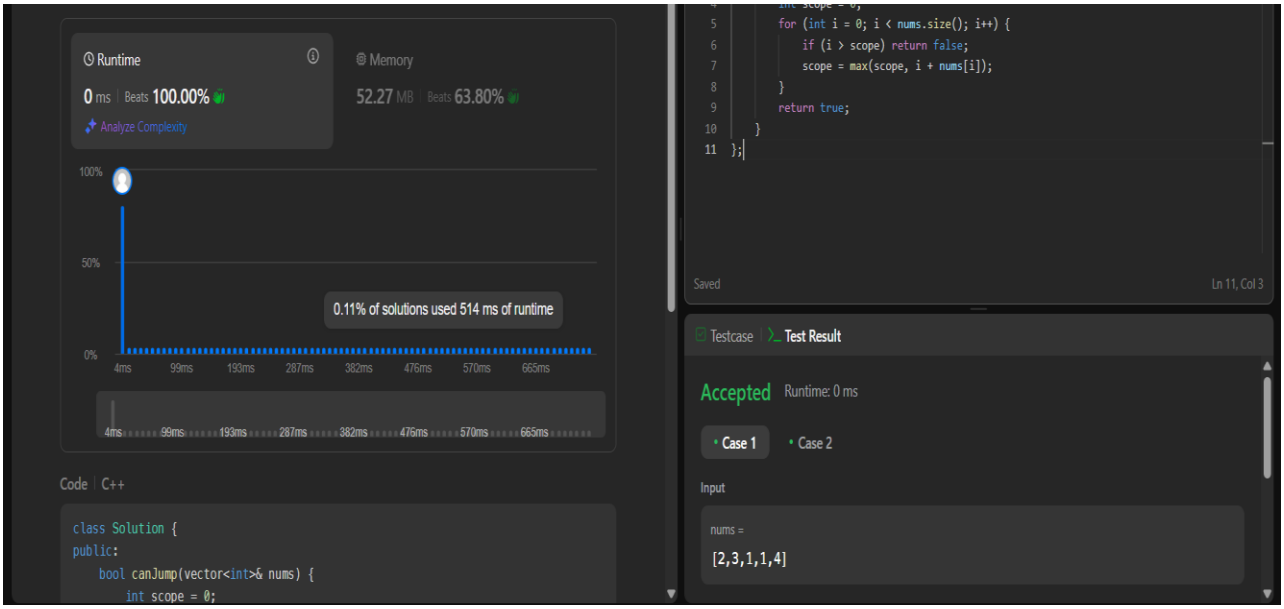


Problem 2: Jump Game (https://leetcode.com/problems/jump-game/ **)**

Code:

```
class Solution {

public:

  bool canJump(vector<int>& nums) {

    int scope = 0;

    for (int i = 0; i < nums.size(); i++) {

      if (i > scope) return false;

      scope = max(scope, i + nums[i]);

    }

    return true;

  }

};
```

Screenshot:

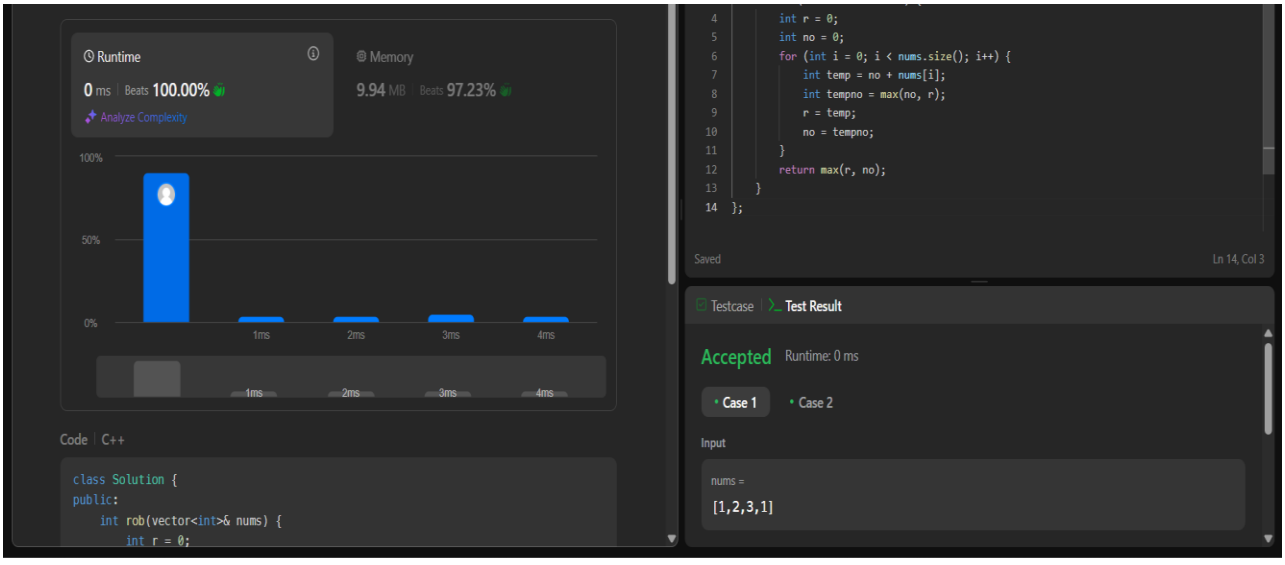


Problem 3: House Robber (https://leetcode.com/problems/house-robber/ **)**

Code:

```
class Solution {

public:

  int rob(vector<int>& nums) {

    int r = 0;

    int no = 0;

    for (int i = 0; i < nums.size(); i++) {

      int temp = no + nums[i];

      int tempno = max(no, r);

      r = temp;

      no = tempno;

    }

    return max(r, no);

  }

};
```

Screenshot:

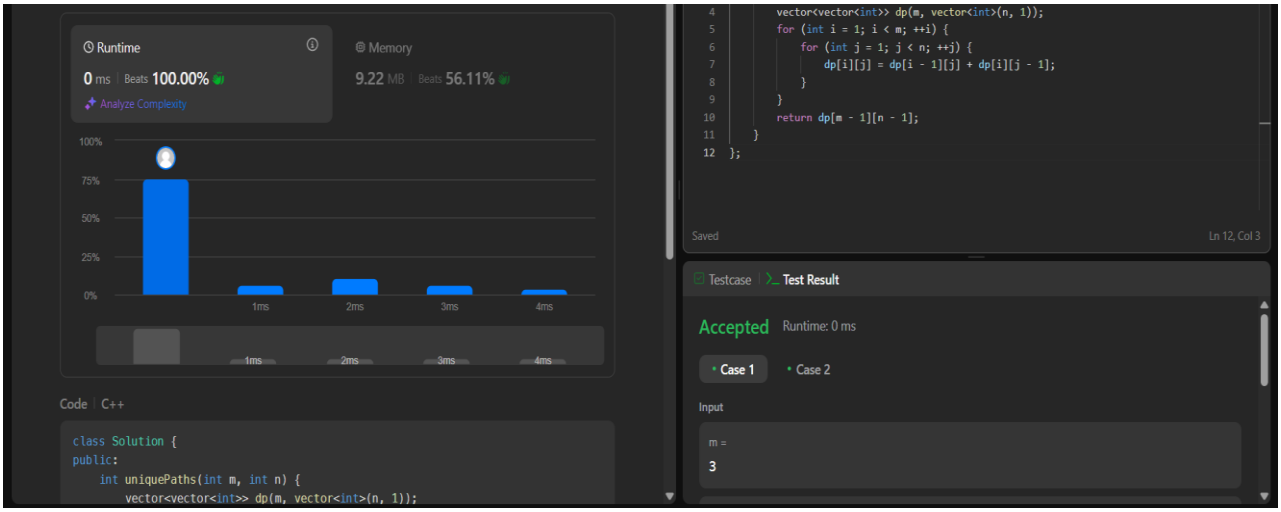


Problem 4: Unique Paths (https://leetcode.com/problems/unique-paths/ **)**

Code:

```
class Solution {

public:

  int uniquePaths(int m, int n) {

    vector<vector<int>> dp(m, vector<int>(n, 1));

    for (int i = 1; i < m; ++i) {

      for (int j = 1; j < n; ++j) {

        dp[i][j] = dp[i - 1][j] + dp[i][j - 1];

      }

    }

    return dp[m - 1][n - 1];

  }

};
```

Screenshot:

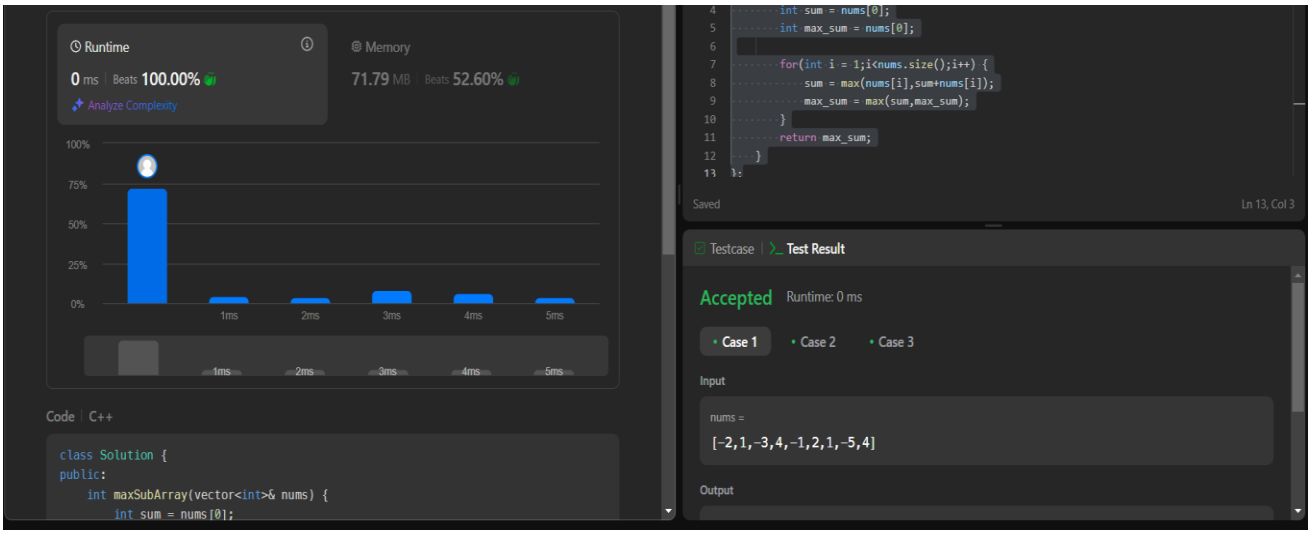


Problem 5: Coin Change (https://leetcode.com/problems/coin-change/ **)**

Code:

```
class Solution {

public:

  int coinChange(vector<int>& coins, int amount) {

    vector<int> dp(amount + 1, INT_MAX);

    dp[0] = 0;

    for (int i = 1; i <= amount; ++i) {

      for (int coin : coins) {

        if (i - coin >= 0 && dp[i - coin] != INT_MAX) {

          dp[i] = min(dp[i], dp[i - coin] + 1);

        }

      }

    }

    return dp[amount] == INT_MAX ? -1 : dp[amount];

  }

};
```

Screenshot:



Problem 6: Maximum Product Subarray (https://leetcode.com/problems/maximum-product-subarray/ **)**

Code:

```
class Solution {

public:

  int maxProduct(vector<int>& nums) {

    int n = nums.size();

    int maxProduct = nums[0], currentMax = nums[0], currentMin = nums[0];

    for (int i = 1; i < n; ++i) {

      if (nums[i] < 0) {

        swap(currentMax, currentMin);

      }

      currentMax = max(nums[i], currentMax * nums[i]);

      currentMin = min(nums[i], currentMin * nums[i]);

      maxProduct = max(maxProduct, currentMax);

    }

    return maxProduct;

  }

};
```

Screenshot: