Marwadi University	**Marwari University** **Faculty of Technology** **Department of Information and Communication Technology**	
Subject: Design and Analysis of Algorithms (01CT0512)	**Name: Nikhil Bhanderi**	**Class: 5EK1--C**
Long Hour Coding	**Date: 02-08-2025**	**Enrollment No: 92301733054**

Company Name: Adobe

Easy Question 1

Code:

```
class Solution {
public:
    string reverseWordsRec(const string& s, int start = 0)
    {
        int n = s.size();
        while (start < n && s[start] == '.')
        {
            start++;
        }
        if (start == n) return "";
        int end = start;
        while (end < n && s[end] != '.') {
            end++;
        }
        string currentWord = s.substr(start, end - start);
        string rest = reverseWordsRec(s, end);

        if (rest.empty()) {
            return currentWord;
        } else {
            return rest + "." + currentWord;
        }
    }
    string reverseWords(string s) {
        return reverseWordsRec(s, 0);
    }
};
```

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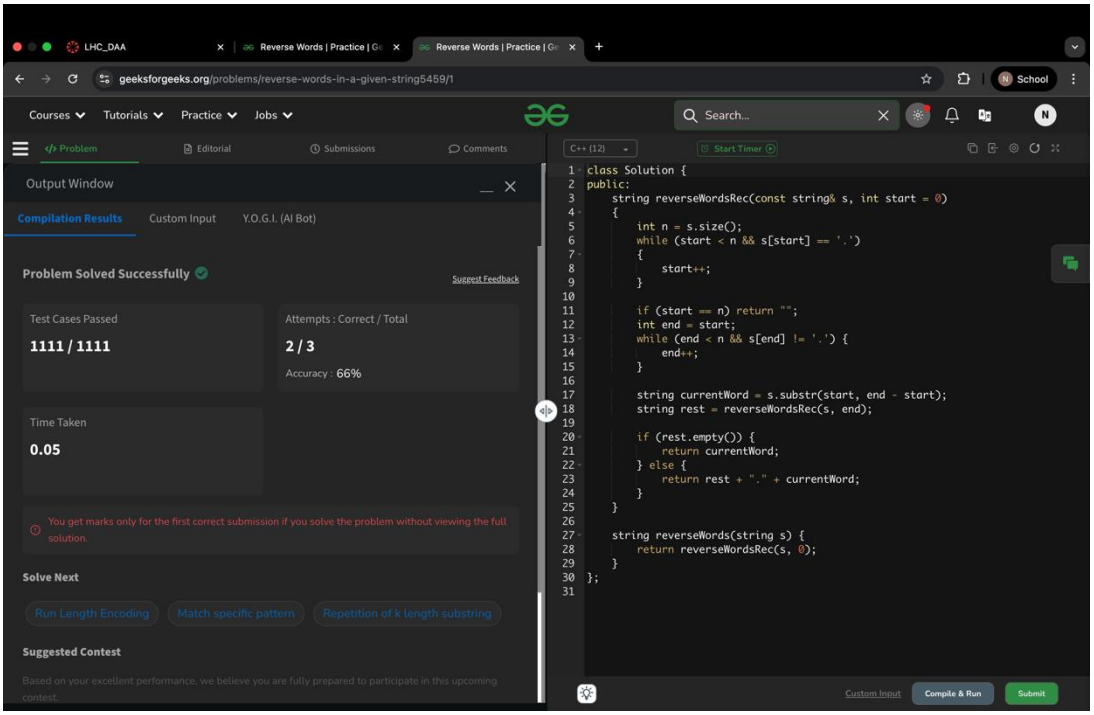
Output:



Easy Question 2

Code:

```
class Solution {
public:
    bool hasPathSum(Node* root, int targetSum) {
        if (root == nullptr) {
            return false;
        }

        if (!root->left && !root->right) {
            return targetSum == root->data;
        }

        return hasPathSum(root->left, targetSum - root->data) ||
               hasPathSum(root->right, targetSum - root->data);
    }
};
```

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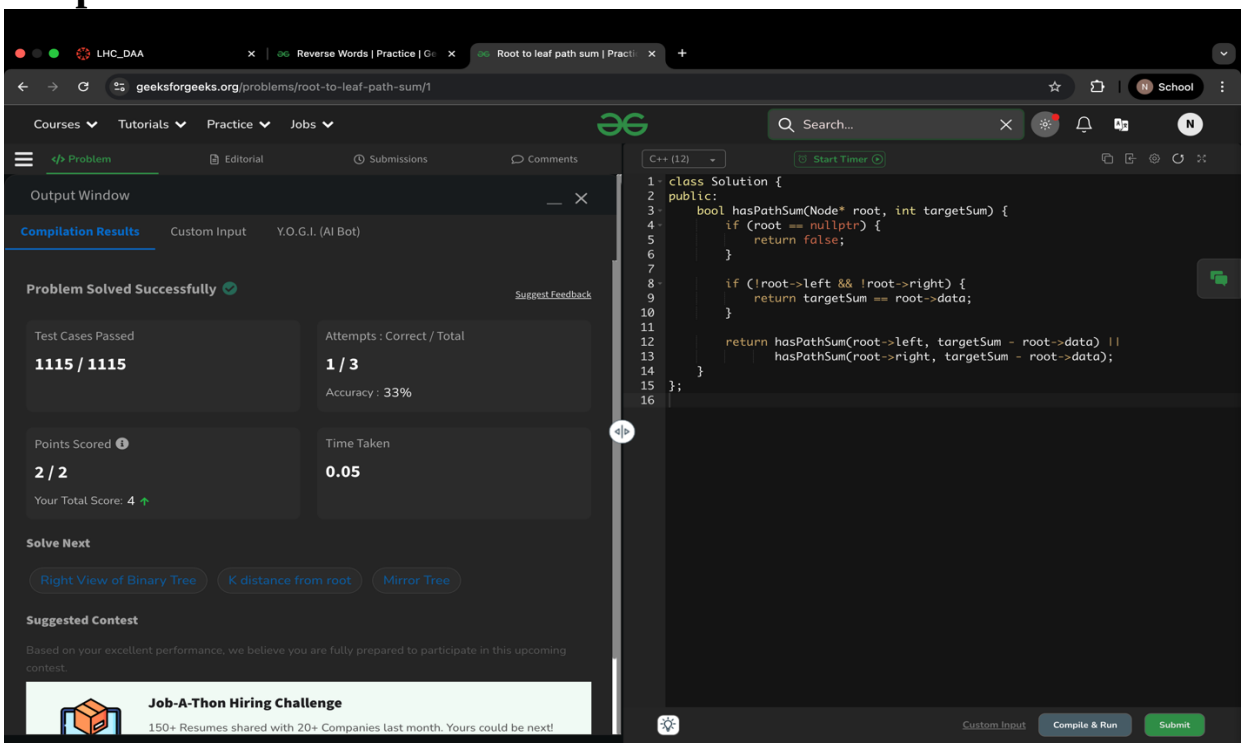
Output:



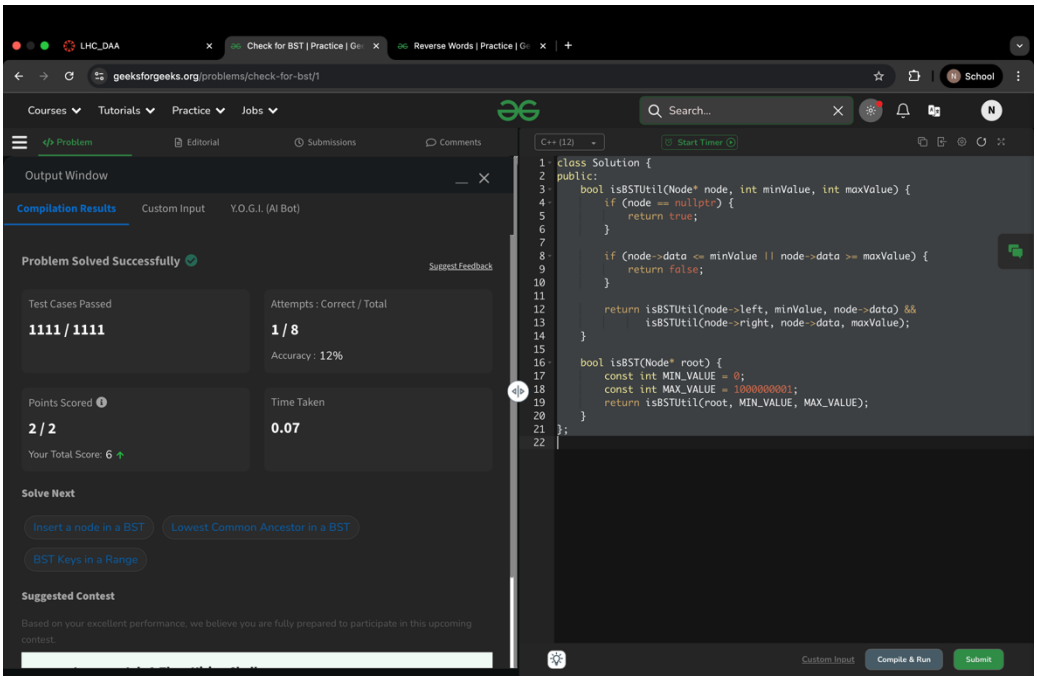
Easy Question 3

Code:

```
class Solution {
public:
    bool isBSTUtil(Node* node, int minValue, int maxValue) {
        if (node == nullptr) {
            return true;
        }
        if (node->data <= minValue || node->data >= maxValue) {
            return false;
        }
        return isBSTUtil(node->left, minValue, node->data) &&
               isBSTUtil(node->right, node->data, maxValue);
    }
    bool isBST(Node* root) {
        const int MIN_VALUE = 0;
        const int MAX_VALUE = 1000000001;
        return isBSTUtil(root, MIN_VALUE, MAX_VALUE);
```

```
    }
};
```

Output:



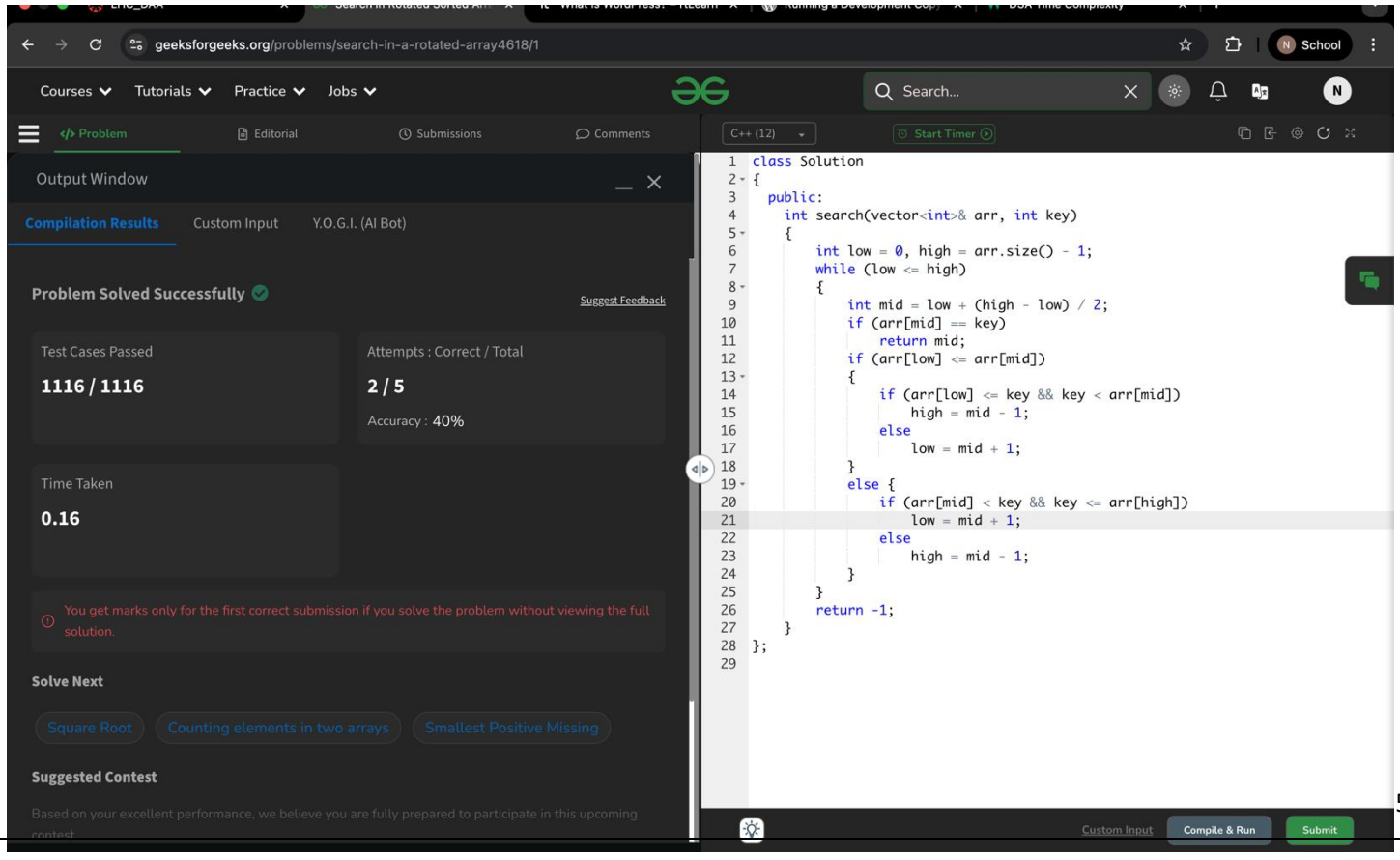
Easy Question 4

Code:

```
class Solution
{
  public:
    int search(vector<int>& arr, int key)
    {
        int low = 0, high = arr.size() - 1;
        while (low <= high)
        {
            int mid = low + (high - low) / 2;
            if (arr[mid] == key)
                return mid;
            if (arr[low] <= arr[mid])
            {
                if (arr[low] <= key && key < arr[mid])
```

```
            high = mid - 1;
        else
            low = mid + 1;
    }
    else {
        if (arr[mid] < key && key <= arr[high])
            low = mid + 1;
        else
            high = mid - 1;
    }
  }
  return -1;
 }
};
```

Output:



Easy Question 5

Code:

```
class Solution {
  public:
    Node* reverseList(Node* head) {
        Node* prev = NULL;
        Node* curr = head;
        Node* next = NULL;

        while (curr != NULL) {
            next = curr->next;
            curr->next = prev;
            prev = curr;
            curr = next;
        }
        return prev;
    }
};
```

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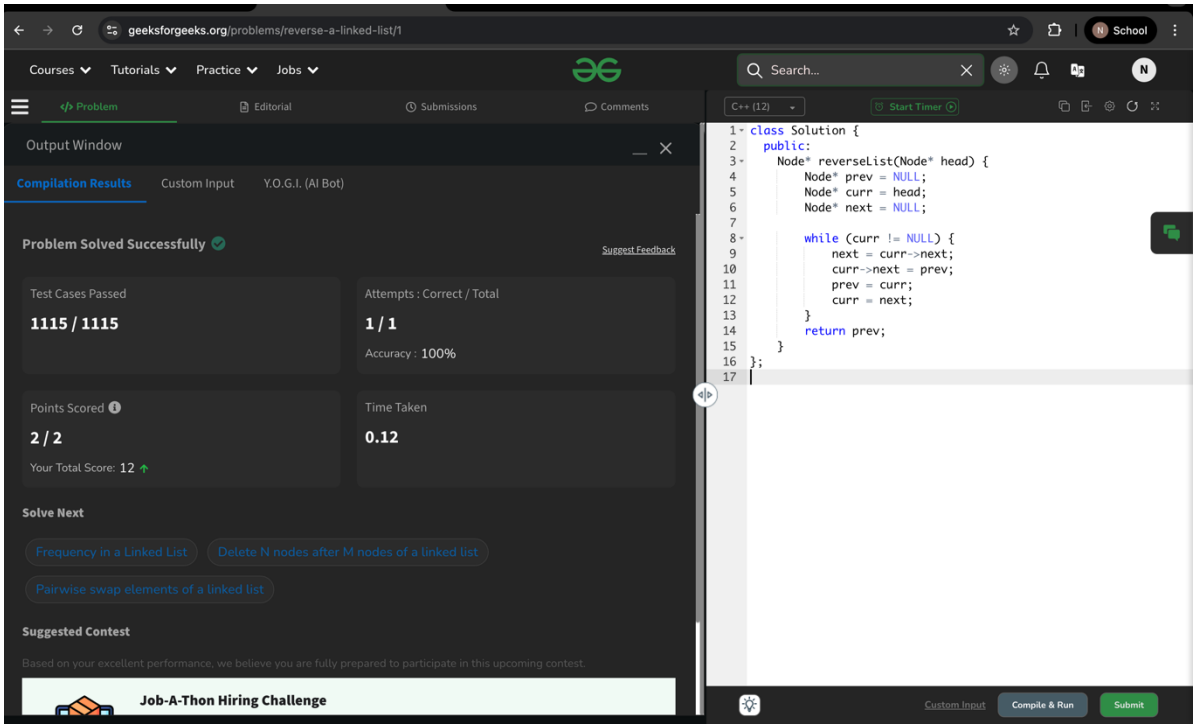
Output:



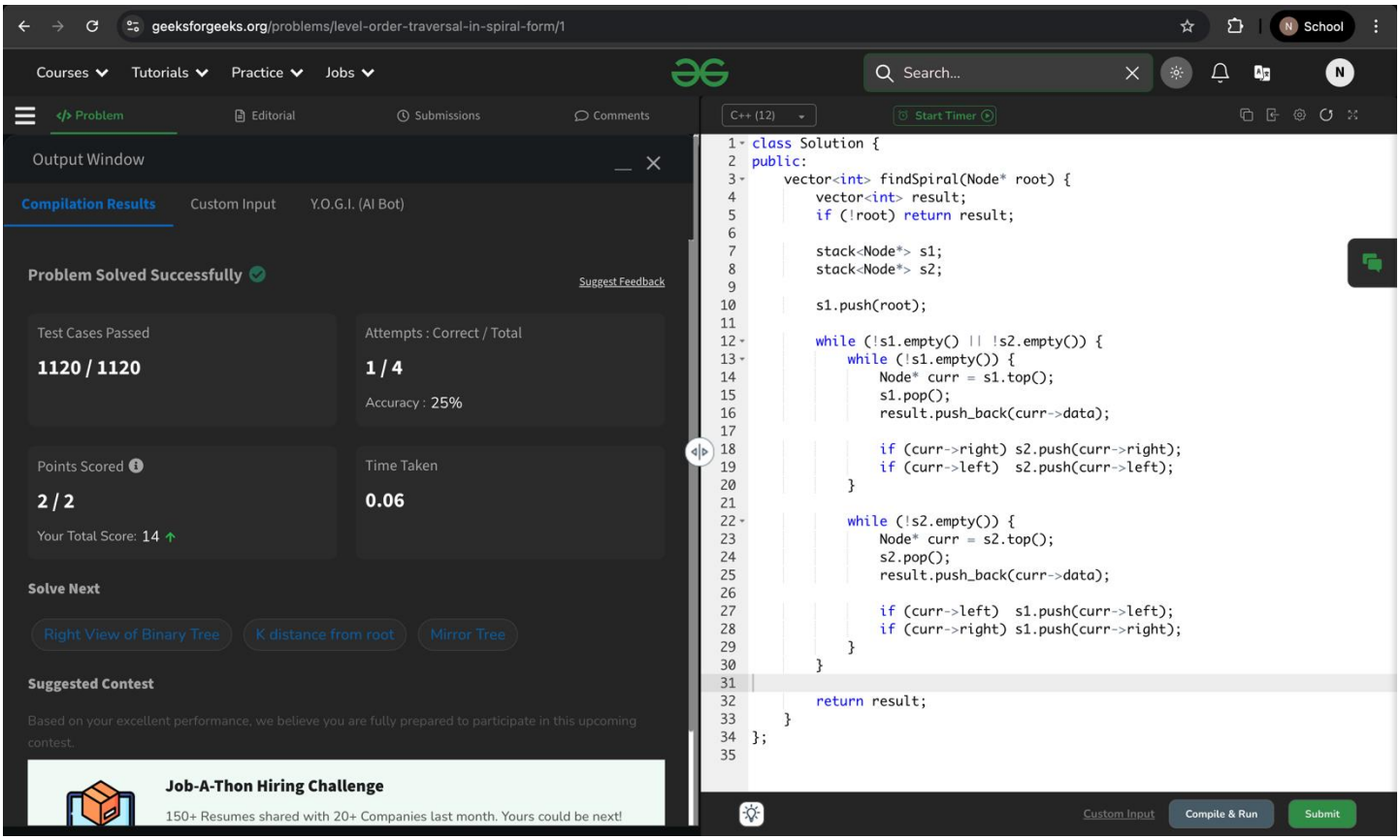
Easy Question 6

Code:

```
class Solution {
public:
    vector<int> findSpiral(Node* root) {
        vector<int> result;
        if (!root) return result;
        stack<Node*> s1;
        stack<Node*> s2;
        s1.push(root);
        while (!s1.empty() || !s2.empty()) {
            while (!s1.empty()) {
                Node* curr = s1.top();
                s1.pop();
                result.push_back(curr->data);
                if (curr->right) s2.push(curr->right);
```

```
            if (curr->left)  s2.push(curr->left);
        }
        while (!s2.empty()) {
            Node* curr = s2.top();
            s2.pop();
            result.push_back(curr->data);
            if (curr->left)  s1.push(curr->left);
            if (curr->right) s1.push(curr->right);
        }
    }
    return result;
  }
};
```

OUTPUT:



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