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***Assignment no 2***

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***Submitted to***

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***Subject . Lab Data structure***

***Lab . 4***

***Topic. Singly link list***

Questions no 1. Write a function to insert a node at a specific position in a singly linked list, ensuring valid position handling.

#include <iostream>

using namespace std;

class Node {

public:

int data;

Node\* next;

Node(int value) {

data = value;

next = nullptr;

}

};

class SinglyLinkedList {

public:

Node\* head;

SinglyLinkedList() {

head = nullptr;

}

void insertAtStart(int data) {

Node\* newNode = new Node(data);

newNode->next = head;

head = newNode;

}

void insertAtEnd(int data) {

Node\* newNode = new Node(data);

if (head == nullptr) {

head = newNode;

return;

}

Node\* last = head;

while (last->next != nullptr) {

last = last->next;

}

last->next = newNode;

}

void insertAtPosition(int data, int position) {

if (position < 1) {

cout << "Invalid position!" << endl;

return;

}

if (position == 1) {

insertAtStart(data);

return;

}

Node\* newNode = new Node(data);

Node\* temp = head;

for (int i = 1; i < position - 1; i++) {

if (temp == nullptr) {

cout << "Position exceeds list length!" << endl;

return;

}

temp = temp->next;

}

newNode->next = temp->next;

temp->next = newNode;

}

void display() {

if (head == nullptr) {

cout << "List is empty." << endl;

return;

}

Node\* temp = head;

while (temp != nullptr) {

cout << temp->data << " -> ";

temp = temp->next;

}

cout << "None" << endl;

}

};

int main() {

SinglyLinkedList list;

list.insertAtStart(10);

list.display();

list.insertAtEnd(20);

list.display();

list.insertAtPosition(15, 2);

list.display();

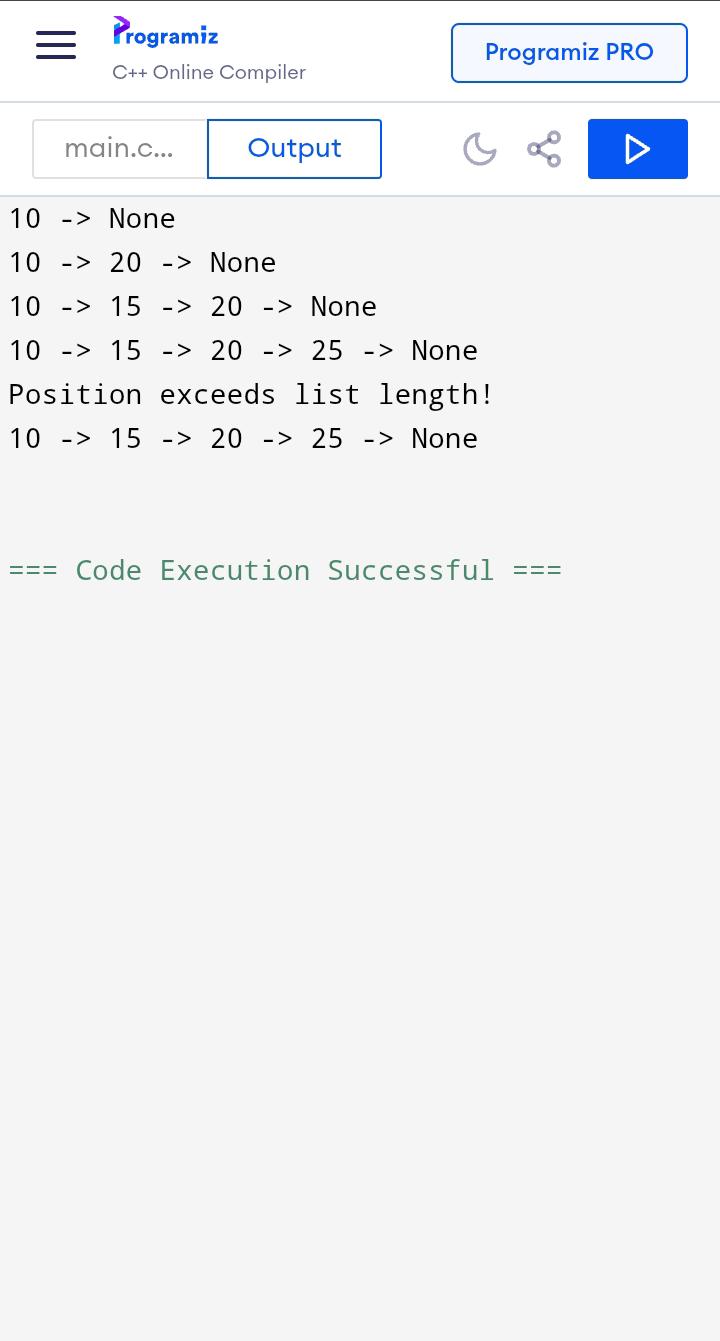
list.insertAtPosition(25, 4);

list.display();

list.insertAtPosition(30, 10);

list.display();

return 0;

}