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Subject:

“DSA LAB ”

Section

BSSE-3A

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(Lab Task 4)

Q1: Singly Linked List (Insert at Specific Location)

Task: Write a function to insert a node at a specific position in a singly linked list, ensuring valid position handling.

Answer:

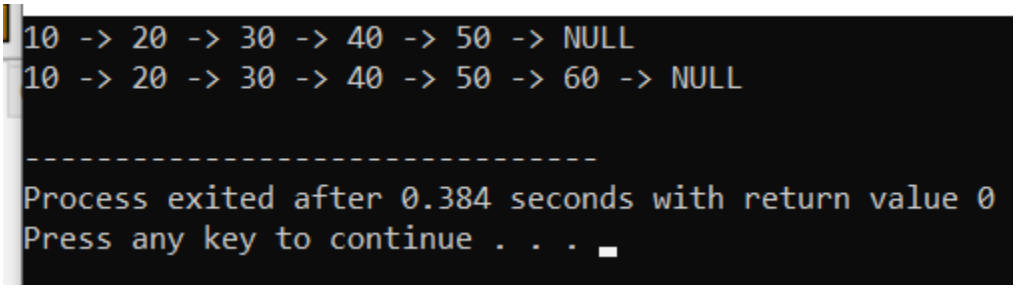
```
#include <iostream>
using namespace std;
struct Node {
    int data;
    Node* next;
};
void insertAtPosition(Node** head, int data, int position) {
    Node* newNode = new Node();
    newNode->data = data;
    newNode->next = NULL;
    if (*head == NULL || position == 0) {
        newNode->next = *head;
```

```
        *head = newNode;
        return;
    }
    Node* current = *head;
    for (int i = 0; i < position - 1 && current != NULL; i++) {
        current = current->next;
    }
    if (current == NULL) {
        cout << "Position out of range!" << endl;
        delete newNode;
        return;
    }
    newNode->next = current->next;
    current->next = newNode;
}
void displayList(Node* head) {
    Node* current = head;
    while (current != NULL) {
        cout << current->data << " -> ";
        current = current->next;
    }
    cout << "NULL" << endl;
}
```

```
// Main function

int main() {
    Node* head = NULL;

    insertAtPosition(&head, 10, 0);
    insertAtPosition(&head, 20, 1);
    insertAtPosition(&head, 30, 2);
    insertAtPosition(&head, 40, 3);

    cout << "Original Linked List: ";
    displayList(head);

    insertAtPosition(&head, 50, 4);
    cout << "Linked List after inserting 50 at position 4: ";
    displayList(head);

    insertAtPosition(&head, 60, 10);
    cout << "Linked List after inserting 60 at position 10: ";
    displayList(head);

    return 0;
```

```
}
```

Output:


10 -> 20 -> 30 -> 40 -> 50 -> NULL
10 -> 20 -> 30 -> 40 -> 50 -> 60 -> NULL

Process exited after 0.384 seconds with return value 0
Press any key to continue . . .