**University of Michigan – Dearborn**

**CIS 200 – Computer Science 2**

**Lab# 5**

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# Question 1

## Source Code

The source code for this question has been uploaded to Canvas as Lab\_5.cpp.

## Description

This program implements and demonstrate fundamental operations on linked list such as insertion, deletion, and display. Linked list now can work with different data types using templates

## Structures

* Template <typename T>
* Define a Node class with value and Node\*<T> next
* Define a LinkedList class with Node head
* Define a Address class with string street, string city, string state, string zip

## Screenshots

Testing case 1&2&3

A screenshot of a computer

Description automatically generated

# UML Diagram

A screenshot of a computer program

Description automatically generated

# Testing

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Test # | Input value | Expected output | Actual output | Test Pass/Fail |
| 1 | **Insert integers:**  Insert front node : 2,3,9  ->Output  Delete first node  ->Output  Get front node | 9 3 2  3 2  Front node is 3 | 9 3 2  3 2  Front node is 3 | Pass |
| 2 | **Insert floats:**  Insert front node : 2.5, 3.1, 9.2  ->Output  Delete first node  ->Output  Get front node | 9.2 3.1 2.5  3.1 2.5  Front node is 3.1 | 9.2 3.1 2.5  3.1 2.5  Front node is 3.1 | Pass |
| 3 | **Insert addresses:**  Insert front node:   * 14 South Drive, Dearborn, Michigan, 10000 * 100 West Ave, Ann Arbor, Michigan, 15000 * 01 East Street, Boston, New York, 30000 * 1241 West Road, Houston, Texas, 00050   ->Output  Delete first node  ->Output  Get front node | 1241 West Road, Houston, Texas, 00050  01 East Street, Boston, New York, 30000  100 West Ave, Ann Arbor, Michigan, 15000  14 South Drive, Dearborn, Michigan, 10000  Delete first node:  01 East Street, Boston, New York, 30000  100 West Ave, Ann Arbor, Michigan, 15000  14 South Drive, Dearborn, Michigan, 10000  Front node is :  01 East Street, Boston, New York, 30000 | 1241 West Road, Houston, Texas, 00050  01 East Street, Boston, New York, 30000  100 West Ave, Ann Arbor, Michigan, 15000  14 South Drive, Dearborn, Michigan, 10000  Delete first node:  01 East Street, Boston, New York, 30000  100 West Ave, Ann Arbor, Michigan, 15000  14 South Drive, Dearborn, Michigan, 10000  Front node is :  01 East Street, Boston, New York, 30000 | Pass |