# Department of Computing

**CS250: Data Structure and Algorithms**

**Class: BSCS-6C**

**Lab 6: Singly Linked List**

**Date: October 20, 2017**

**Time: 0900 to 1200**

# Instructor: Abid Rauf

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**Lab 6: Singly Linked List**

**Introduction**

The Lab consists of dynamic singly linked lists

**Objectives**

In this lab you will learn the basic operations of linked lists.

**Tools/Software Requirement**

Visual Studio C++

**Description**

The basic operation consists of creating the list, inserting nodes, deleting nodes and displaying the nodes in a linked list.

**Lab Tasks**

You are required to upload the lab tasks on LMS and the name of that tasks must be in this formatYourFullName\_reg#.cpp

Remember to comment your code properly. Inappropriate or no comment will results in deduction of marks.

**Task 1**

It is a singly linked list, with each node having two elements namely (i) integer type value and (ii) Node type pointer to point to the next node. Create a class linked list and implement the following functions:

1. Creating the list
   1. Initialize pointers to NULL;
2. Inserting nodes
   1. Insert at beginning
   2. Insert at a specific location.
   3. Insert at last
3. Deleting nodes from
   1. The beginning
   2. The specific location
   3. The last
4. Traversing the list to display the content
5. Searching a specified item in the list
6. Destroying the list

Write your own simple code.

Create some Lists in main program; e.g.

* **L0:** and test all the above functions by using it. Following functions should work:
  + Create L0 with no nodes at all.
  + Try to delete the last node.
  + Try to delete the node at the start.
  + Append 2, Append 6, Append 8, Append 7, Append 7, Append 1, Append 2, Append 4, Append 3, Append 5, Append 9.
  + Display the list.
  + Try to delete the node with value 7
  + Try to delete the node with value 33
  + Try to delete the last node
  + Try to delete the first node
  + Display the list.

<http://www.sourcetricks.com/2008/07/c-singly-linked-lists.html#.V_6H0-h97IU>

**Task 2:** Create a new linked list L1 and do the following:

1. **L1:** 5, 10,15,20,25,30,35,40
2. Create L1 by using appendNode()
3. Create L2 and L3 in which you remove values from front from L1 and add the deleted values from L1 to L2 and L3 alternately. For example if
4. **L1:** 5, 10, 15, 20, 25, 30, 35, 40 then
5. **L2:** 5, 15, 25, 35
6. **L3:**10, 20, 30, 40
7. Check your code by displaying all the three Lists (L1 to L3)

**Deliverable**

Students are required to upload the lab task on LMS before the deadline. Compile a single Word document by filling in the solution/answer part and submit this Word file on LMS.

This lab is graded. Min marks: 0. Max marks: 10.