# Department of Computing

**CS250: Data Structure and Algorithms**

**Class: BEE-6AB**

# Lab 3: Singly Linked List

**Date: 1st October, 2015**

**Time: 10am-1pm & 2pm-5pm**

# Instructor: Mr. Faisal Shafait

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# Lab 3: Singly Linked List

**Introduction**

This lab will introduce students with the practical implementation of linked list with its operations.

**Objectives**

Objective of this lab is to get familiar with singly linked list and implement them in C++.

**Tools/Software Requirement**

Visual Studio C++

**Description**

**Singly Linked List**

A Linked List, is a data structure consisting of a group of nodes which together represent a sequence. Under the simplest form, each node is composed of two parts i.e. data part and a reference part (also known as, a link) to the next node in the sequence. This structure allows efficient insertion or removal of elements from any position in the sequence.

## Singly-linked-list.svg

## The basic operation consist of

* Creating the list.
* Initialize pointers to NULL.
* Inserting nodes at beginning, last and specified location.
* Delete nodes from beginning, last and specified location.
* Traversing the list.
* Destroying the list.

**Lab Tasks**

Write a C++ program that can

1. Create a simple linked list using function, by inserting nodes at head.

2. Make a function that can insert another node at 3rd location.

3. Make a function that can display the lists made in 1 and 2.

4. Write a function that can delete node from the linked list selected by the user. Display it as well.

5. Write a function that can count the number of nodes present in list.

6. Create menu in main function to give call to all of the above functions depending upon user’s input.

**Hint:** First you will create the relevant classes, and the functions will belong to the List class.

//class of node

class node

{

public:

int value;

node \*next;

};

Required functions for list class are:

void insert\_at\_beginning(int new\_value)

void insert\_at\_loc(int location,int new\_value)

void del(int del\_value)

void display()

void count()

**Deliverables**

Students are required to upload the lab on LMS before deadline.

**Note:** Use proper indentation and comments. Lack of comments and indentation will result in deduction of marks. You will submit your working **.cpp** files in one **(.zip)** folder. The name of files and folder should follow this format. i.e. **YOUR\_NAME\_Lab#**