

# CSE 4252: Lab 6 (20 Points)

**Due Date: December 5th (11:59 PM)**

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## Overview

This exercise will familiarize you with Templates in C++.

## Exercise 1 Description

In this lab you will implement the linked list class as a template class. It contains:

- LinkedList.h
- LinkedList.cpp
- template\_test.cpp, a driver program you should fill in

To convert the class to a template class you must **[3 points]**:

1. Put the entire class (the .h file class definition, and the .cpp file method implementations) in one .h file. For this lab, put the entire class into LinkedList.h
2. Preface the **template class definition** and **each template member function implementation** with this line: **template <class Type>**
3. The class qualifier (LinkedList::) that appears before a method name in each implementation, should be replaced by **LinkedList<Type>::**
4. Whenever the type that the class contains (int in our case) is referred to it should be replaced with the word **Type**

You should implement following member functions:

Method	Goal	Points
add ()	A new node containing the given data is inserted at the front of the list	2
insertAt ()	A new node containing the given data is inserted at the given position in the list	4
findVal ()	The first incidence of the given data found from the list. Returns true if data is found, false otherwise	4

Two functions (removeAll, printList) and the constructors are implemented. You can write other functions by reference to the code.

For example, here is the add method before and after these changes:

```
void LinkedList::add(int x) {  
    ...  
}  
  
-----  
//the "templated" version  
template <class Type>  
void LinkedList<Type>::add(Type x) {  
    ...  
}
```

To use your linked list template class in a program you need to specify what type is to be stored:

- `LinkedList<int>` creates a linked list of ints, and
- `LinkedList<string>` creates a linked list of strings

Test your linked list template by writing a driver program in `template_test.cpp` that creates an int linked list and a string linked list, and uses each of the `LinkedList` methods at least once. Record the *script* in **Lab6.txt**.

## Submission Instructions

Make sure your programs compile and run correctly before submitting. To submit, zip all the files in **Lab6.zip** and upload on carmen.

**LinkedList.h** [13 points]

**template\_test.cpp** [5 points]

**Lab6.txt** [2 points]