

# The University of the South Pacific

School of Computing, Information & Mathematical Sciences

CS 112 Data Structures and Algorithms

**Semester 2, 2009**

**Assignment 2**

**(Linked List)**

## Problem statement

An advantage of linked lists over arrays is that you don't have to specify the size at all. The size of a linked list grows and shrinks dynamically depending on the user's requirement.

You are required to complete the missing implementations of three functions for the 2 dimensional linked list project given in Moodle. Download these files for 2 dimensional linked list from Assignment2 folder on Moodle.

Write the code for the following functions:

1. ***get\_data***: This function finds the data stored in the specified row and column of a 2 dimensional linked list. If data retrieval is successful return true otherwise return false.

The prototype is given below:

```
template <class T>
bool get_data(int row, int col, T& data);
```

2. ***update\_data***: This function updates the data located in the specified row and column of a 2 dimensional linked list. As above, return true if data update is successful and return false otherwise. The prototype is given below. Note that *const* argument indicates that the value will not change inside the function. This is a good programming practice.

```
template <class T>
bool update_data(int row, int col, const T data);
```

3. ***remove\_data***: This function removes a node located in the specified row and column from 2 dimensional linked list. If the node does not exist then return false other wise remove the node and return true. The prototype is given below:

```
template <class T>
bool remove_data(int row, int col);
```

USE THE GIVEN FILES TO CREATE YOUR DEV C++ 4.0 OR VISUAL C++ EXPRESS EDITION PROJECT. DO NOT CHANGE ANY GIVEN FUNCTION OR FILE NAMES

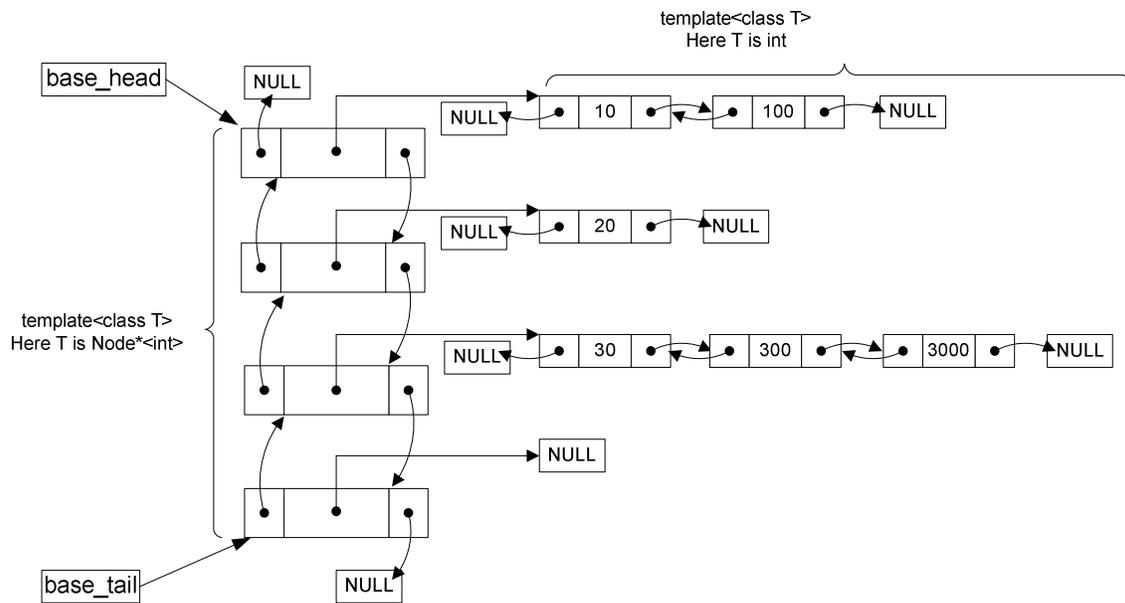
## Submission Guidelines

Submit your whole Dev C++ 4.0 OR Visual C++ Express Ed. project through Moodle *Assignment 2 submission* link. This assignment has to be submitted in groups of 2. The Id Numbers with Surname & First Name has to be written in the code. Assign a group leader and submit the assignment through the group leader's moodle account. This time individual assignments will strictly receive 50% of the achieved marks. You have to submit just one zipped file of your project. The submission filename should read *assign2\_SXXXX\_SYYYY.zip* or *assign2\_SXXXX\_SYYYY.rar* where SXXXX is the student id of the group leader and SYYYY is the student id of another group member.

**Due Date - 29th October, 23h00.**

## Appendix

Graphical view of 2 dimensional linked list



Explanation: The first column with bigger nodes are nodes with data Node\*<int>. That is why their data are pointing to Node<int>. Each node in the first column points to the first node of a linked list of integer data to create 2 dimensional linked list.

- Anurag Sharma