316 Data Structures

Assignment #2

(Due: Sept. 28, 2012)

Objective: To practice the programming skills with linked-list-based implementation for binary trees.

First, you need to implement a Binary Tree using a Linked List. Then, you provide the following functions in your program. Please try to write a small main.cpp to only include calling functions. Your program must be complied and tested without any errors. If your program cannot be compiled, you lose 50% of the total mark.

(Note: the keys are the values held by nodes.)

1. (15 points) Write a function that returns the sum of all the keys in a binary tree.

2. (15 points) Write a function that prints all the keys less than a given value *v* in a binary tree.

3. (15 points) Write a function to find the depth of a given node in a binary tree.

4. (25 points) The cost of a path in a tree is sum of the keys of the nodes participating in that path. Write a function that returns the cost of the most expensive path from the root to a leaf node a binary tree.

5. (30 points) A binary tree is said to be "balanced" if both of its subtrees are balanced and the height of its left subtree differs from the height of its right subtree by at most 1. Write a function to determine whether a given binary tree is balanced.

Submission: follow the instructions at http://cs.uakron.edu/~echeng/Submission_How.html. Use course number 3460:316.
