

## Practical -7: Binary Trees

Spring Semester 2017-18

Define binary trees, binary search tree, and heap.

For a binary tree the in-order and pre-order traversal listings are given:

in-order: a, h, c, g, f, e, d, b

pre-order: h, a, e, g, c, f, b, d

Obtain the binary tree. Explain the steps involved.

Give its array and linked representation. Also, give its level order listing.

Write a function that returns the depth of a binary tree stored as a linked list.

Write algorithms to return the predecessor and successor of a given node in symmetrically threaded binary tree.

Obtain symmetrically threaded binary tree representation for the expression:

$$(x + a) \left( \frac{b + c - d}{y/(e + f)} - k \right)$$

Hence obtain the equivalent postfix expression.

Write a function **minHeap** for arranging the sequence of keys in min heap stored in an array.

Assume that the given set of keys are arranged in a min heap and stored in an array. Write a function **heapSort()** in C++ which will display the sorted sequence in descending order.

Write a function that will perform binary search in an array where a sequence of integers are stored in ascending order.

Construct binary search tree from the sequence of keys given below:

40, 55, 70, 60, 45, 100, 50, 80, 90, 35

Explain the steps involved in the construction.

0. Write a class **BST** to implement binary search tree stored as a linked list. It must include constructor, destructor, creation, searching and in order traversal.