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Lab Manual **:** 08
Course Code : CSE207
Course Title : Data Structure
Instructor : Dr. Maheen Islam, Associate Professor, CSE

Objective:

The objective of this lab is to provide basic concept of Binary Heap. At the end of the lab, students are able:

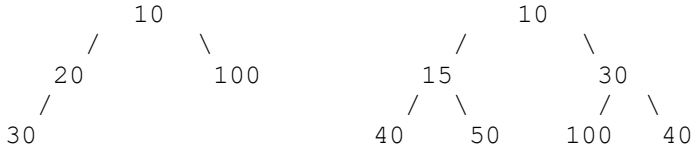
- To learn how to create Heap
- To learn how to perform Insertion, Deletion of heap
- To use Heap to implement priority queue
- To use Heap Sort technique to sort data

Binary Heap:

A Binary Heap is a Binary Tree with following properties.
1) Its a complete tree (All levels are completely filled except possibly the last level and the last level has all keys as left as possible). This property of Binary Heap makes them suitable to be stored in an array.

2) A Binary Heap is either Min Heap or Max Heap. In a Min Binary Heap, the key at root must be minimum among all keys present in Binary Heap. The same property must be recursively true for all nodes in Binary Tree. Max Binary Heap is similar to Min Heap.

Examples of Min Heap:



Exercise 1:

Insert Operation

If we build a heap then we add a new key at the end of the tree. IF we want to build min heap then if new key is greater than its parent, then we don't need to do anything. Otherwise, we need to traverse up to fix the violated heap property.

Exercise 2:

Deletion Operation

Perform deletion operation of Binary Heap

Exercise 3:

Smallest and Largest Element

Find maximum and minimum element from Heap

Exercise 4:

Heap Sort

Write a program that will sort given list of data using Heap Sort algorithm.

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