**Lab 1**

**(Use any programming language)**

**The input size atleast 105**

**Derive the time complexity of the algorithm using Asymptotic analysis.**

**Implement the program.**

**A graph should be plotted depicting the running time of your program for varied input sizes and various types of input. Also compare the running time of your program with the theoretical bound.**

**Due date: August 25, 2013**

Visit website [www.trainenquiry.com](http://www.trainenquiry.com)

This is a site where you can search for the details of the train based on train number, train name, source, destination or a combination of these.

Write an algorithm to implement this type of search facility. You can store the details of the trains such as train number, train name, source and destination. A relaxation on your implementation is :

The search for the train can be based on either train number or train name or source or destination.

Use binary search tree algorithm for your implementation.Consider the following figure. This is an integration of 2 DataStructures. One is Array. In this array you need to store 4 keys. (1, 2, 3, 4). 1 indicates Train number. 2 indicates Train name. 3 indicates Source and 4 indicates Destination. Each index of the array points to a Binary Search Tree.

A[0] points to a BST which has the tree formation based on train number.

A[1] points to a BST which has the tree formation based on train name.

A[2] points to a BST which has the tree formation based on train source.

A[3] points to a BST which has the tree formation based on train destination.

**BST**

**BST**

**BST**

**BST**

**BST**

Input : Train Number : 65333

Output : The details of the train based on train number 65333

Similarly for the other types of inputs such as train name, source and destination.