Department of Computer Science and Engineering
International Institute of Information Technology, Naya Raipur
Analysis of Algorithms

Time: 4:00 hrs | Lab Experiments: Part-I | Maximum Marks: 40

Note: Implement the following Algorithms in C and submit the same by Lab Record

1. 1. Given a sorted array of non-repeated integers $A[1...n], n > 1$ then check whether there is an index i for which $A[i] = i$. Give an algorithm that runs in $O(logn)$ time
   2. Given an array of n elements. Find whether there are two elements in the array such that their sum is equal to given element K or not? in $O(nlogn)$ time.
   3. Given an array of n elements. Find whether there are three elements in the array such that their sum is equal to given element K or not? in $O(n^2)$ time.
   4. Let A and B be two arrays of n elements. Given a number K, draw an $O(nlogn)$ time algorithm for determining whether there exists $a \in A$, $b \in B$ such that $a + b = K$ or not?.
   5. Given an array of n elements, give an algorithm for checking whether there are any duplicate elements in the array or not? in $O(nlogn)$ time.
   6. Given an array of n elements, give an algorithm for finding the element which appears maximum number of times in the array in $O(nlogn)$ time.
2. 1. Write a C program to demonstrate adjacency matrix of a given graph
   2. Write a C program to demonstrate adjacency list of given graph with all possibilities

Note: Every one has to submit the record (Indentation in the program is must) with detailed solution and it's worst case time complexity.

Student's name: End of Experiments