# Sardar Vallabhbhai National Institute of Technology, Surat
# Department of Artificial Intelligence
# Data Structure (AI102)
# B.Tech I - II Semester

## Assignment-1

**Q1:** An array is a bitonic array if all integers from index 0 to index i are sorted in ascending order, and all subsequent integers from index i+1 to n-1 are sorted in descending order. Given a bitonic array of n distinct integers, write a C/C++ program to find the maximum integer in the array in O(log(n)) time.

**Example:**

**Input:** n = 6 , A[] ={1 2 4 8 7 6}

**Output:** 8

**Q2:** Let A[n] be an array of n distinct integers. If i < j and A[i] > A[j], then the pair (i, j) is called an inversion of A. Write a C/C++ program that determines the number of inversions in any permutation on n elements.

**Example:** A = {4, 1, 3, 2} output is 4

**Q3:** Write a C program to manage the details of students using an array of structures.

The program should:

1. Accept the number of students (n) from the user.
2. For each student, input the following details:
    - Roll number (integer)
    - Name (string)
    - Marks (floating-point value)
3. Store the details of all students in an array of structures.
4. Display the details of all students in a formatted way.