Problem Solving & Coding – Level I
[Data Structure Foundations]
(Sorting Problems)

Solve the following problems using computer with help of Python/C++/Java/C# language as means of communication.

Problem 1: Random Lottery Numbers

Create a function named *randomLotteryNumbers* that generates a list containing random selection of 6 numbers from the range of 1 to 49 for a lottery ticket. Ensure that the 6 numbers selected do not contain any duplicates. Keep the numbers in ascending order by sorting list before you return list. Include a main program to test your function.

Problem 2: Removing Outliers

When analyzing data collected as part of a science experiment it may be desirable to remove the most extreme values before performing other calculations. Create a function named *removeOutliers* that takes an array of integers and a non-negative integer, n, as its parameters. The function should create a new copy of the list with the n largest elements and the n smallest elements removed. Then it should return the new copy of the list as the function's only result. The order of the elements in the returned list does not have to match the order of the elements in the original list. Include a main program to test your function.

Problem 3: Sorting in Descending Order

Create a function named *sortIntegersDesc* that sorts given array of integers in descending order. Include a main program to test your function.

Problem 4: String Sorting-I

Create a function named *sortStrings* that sorts given array of strings in descending order with case insensitivity. Include a main program to test your function.

Problem 5: String Sorting-II

Create a function named *sortDomains* that sorts given array of domain names in order of the reversed domain name. For example, the reverse domain of `cs.iitg.edu` is `edu.iitg.cs`. Include a main program to test your function.