

# Lab1 Report

## Problem 1:

The program counts in total 2 functions:

- A main function which reads a list of numbers from a file named “data.txt”, stores those numbers in an array of integers, then sorts the array using a sorting method provided by the c++ library. It then copy the number sorted in another file named “dataSorted.txt” and then call the function percentile 3 times to compute the 25%, 50% and 75% percentiles and then prints the results on the screen.
- The Percentile function which takes a double as parameter and finds the corresponding percentile in the array and returns it.

## Problem 2:

The program counts in total 3 functions:

- A main function which reads the arguments passed by the user, and check for their validity, instantiate an array of integers and fill it with the integers to be permuted, it then call the permutation function and finally prints the very instance of the different permutation since the permutation

function assumed that this number was printed before starting the permutation process.

- A swap method which takes an array input, and two indexes integers and then swaps the numbers at those two indexes in the array.
- A Permutation function which takes 4 parameters ( an array of integers, a starting\_index and end\_index to establish the range of numbers to be permuted and another integer parameter which represents the length of the numbers to be printed on the screen) uses the swap function to swap every possible pair of numbers in the array and print to the screen each instance of the permutation if this one was not printed before. The way this function works is, it picks one number at index i in the array, then call itself recursively which starting\_index i+1 in order to obtain the possible permutations for the remaining of the array.