



## Lab 3 report – Sort and search algorithms and comparison

### 1. Objective:

The student will practice how to

- Implement and give analysis for one of the sorting algorithms (task 1)
- Apply the proper sorting and searching algorithms to solve a given problem. (tasks 2 and 3)
- Give an analysis for the proposed solution.

### 2. Tasks:

#### 2.1. **Running time of algorithms:**

Given an array A, sort it using insertion sort.

**Required:**

- Write a function to calculate number of shifts required to sort the array.
- What is the running time of insertion sort?

#### 2.2. **Missing numbers:**

Given two arrays of integers, find which elements in the second array are missing from the first array.

**Required:**

- Write a function to find the missing numbers from the second array.
- What is the time and space complexity for your code?

#### 2.3. **Minimum absolute difference for an array:**

The absolute difference is the positive difference between two values a and b, is written  $|a-b|$  or  $|b-a|$ . Given an array of integers, find the minimum absolute difference between any two elements in the array.

**Required:**

- Write a function to find the minimum absolute difference.
- What is the time and space complexity for your code?