

DATA STRUCTURE

Lab 4 - Searching and Sorting

Problem 1. Write a program that stores an array of 100 random integers between 1 and 1000. The program should include the following functionalities:

- a) Input and output data of the array.
- b) Sort the array by using all sorting algorithms that you have studied.
- c) Compare the execution time of the sorting algorithms and write the result to a file named "SortingTime.txt".
- d) Search for a given element x from the array using linear search technique.
- e) Search for a given element x from the array using binary search technique.

Problem 2. Develop an application managing a list of students. The information of a student is defined as follows:

typedef struct STUDENT

```
{  
    char name[30];  
    char class[10];  
    float mMath;  
    float mPhysical;  
    float avg;  
};
```

Write a program including the following functions:

- a) Add a new student.
- b) Search a student by name.
- c) Sort the list in descending order based on avg.

Suggestion:

You should reuse your program Lab1.Problem 1 and modify it.