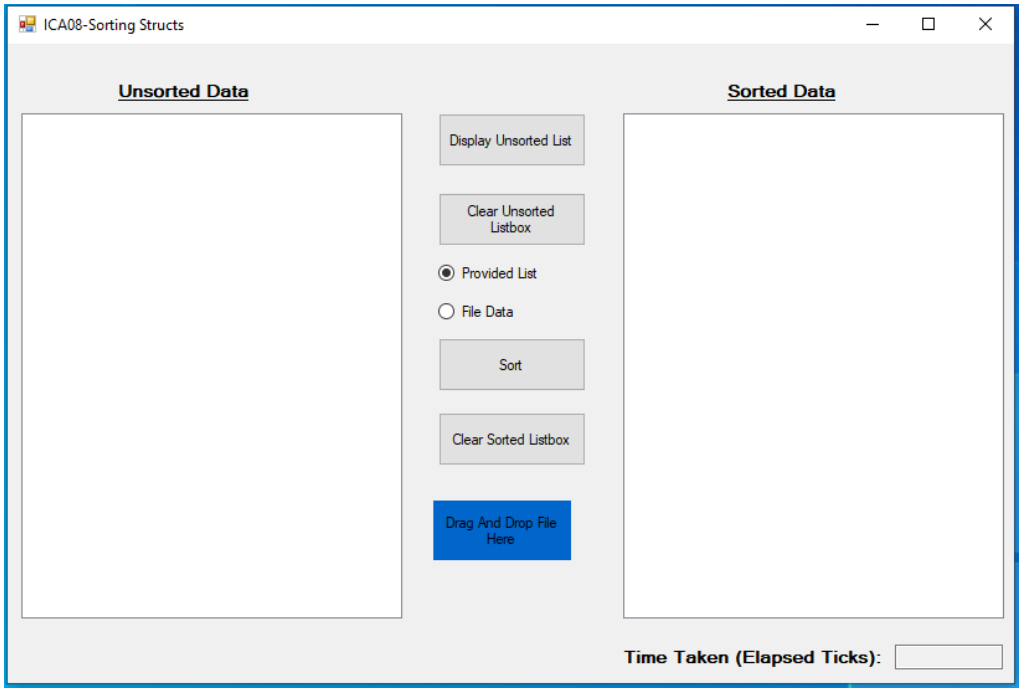
School of Media And Information Technology
Department of IST
Program: CNT

CMPE 1666-ICA 12- Sorting lists of structs using QuickSort

In this assignment, you are going to adapt the quick-sort algorithm to sort a list of structs. You are going to create a simple list of structs from a provided data table to test your algorithm then construct a longer list of structs from data read from the provided text file. Once you are confident that the sorting algorithm is working properly, you'll apply it to the longer list created from the file.

The provided text file contains 1000 lines, each line containing the **employee id** and **salary** of an employee.

Start by creating a form-based application with the controls shown below. The form has 2 list boxes, 4 buttons, a pair of radio buttons, a read-only text box, a label for Drag & Drop, plus a few other labels accompanying the controls.



In the Form class, define an **Employee** struct type having, as members, an **employee id** and **salary**. s.

The application must declare and create 2 lists of Employee structs. One will contain structs built from data given below. The second one will contain structs built from data provided in the file. The 2 lists must also be member variables of the Form1 class.

Adapt the **Quick-Sort** it to sort employee structs in order of employee id.

For easy testing during the development of your code, construct the list of employee structs from the values given in the table below. The easiest way to create the list will be to create 2 arrays, initializing them respectively with the values of the employee ids and salaries given, then iterate through the arrays to create each struct and add it to the list.

Employee ID	Salary
28	4500
53	2800
12	1900
18	3100
8	7000
2	3500
19	2200
57	2800
62	2850
34	3150
23	4000
14	4500
48	6000
35	7200
55	3700
22	2100
26	2450
15	2500
7	3250
9	3700
32	3800
43	4200
41	4100
51	3900

The form load event must cause the creation of a list of Employees from the data provided in the above table.

When the user drags and drops the provided file onto the “Drag And Drop” label, each line of the data from the file must be used to create an **Employee** struct, which must then be added to the second list. Note that each line from the file contains an employee id and a salary. So you will want to split the line, convert to the required type (using TryParse()), then create the struct.

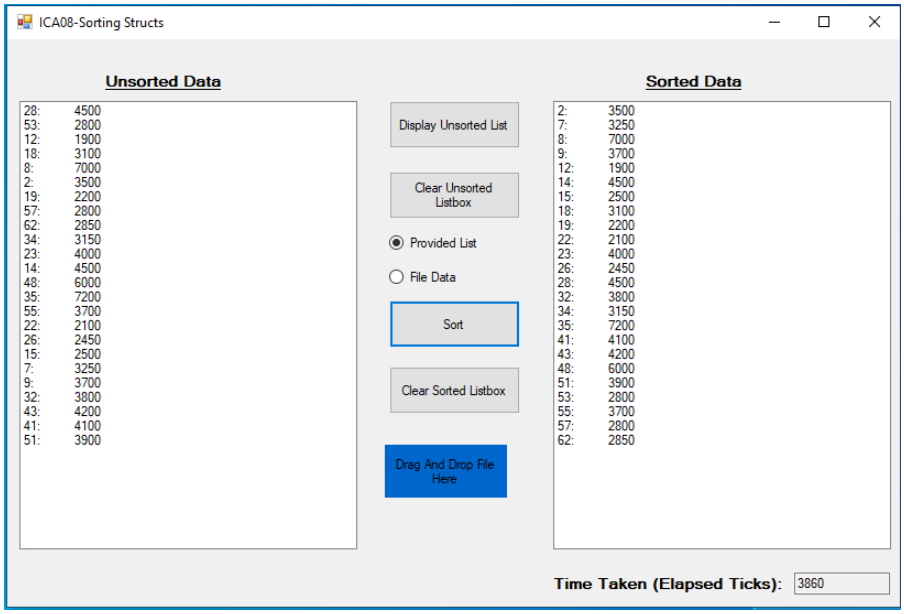
When the user clicks on the “Display Unsorted List” button, if the “Provided List” radio button is checked, the left list box will display the unsorted data from the small list (created from the data provided in the

table). If the “File Data” radio button is checked, the data in the longer list, created from the file will be displayed. The displayed data in both cases will be of the form **employeeId: Salary**

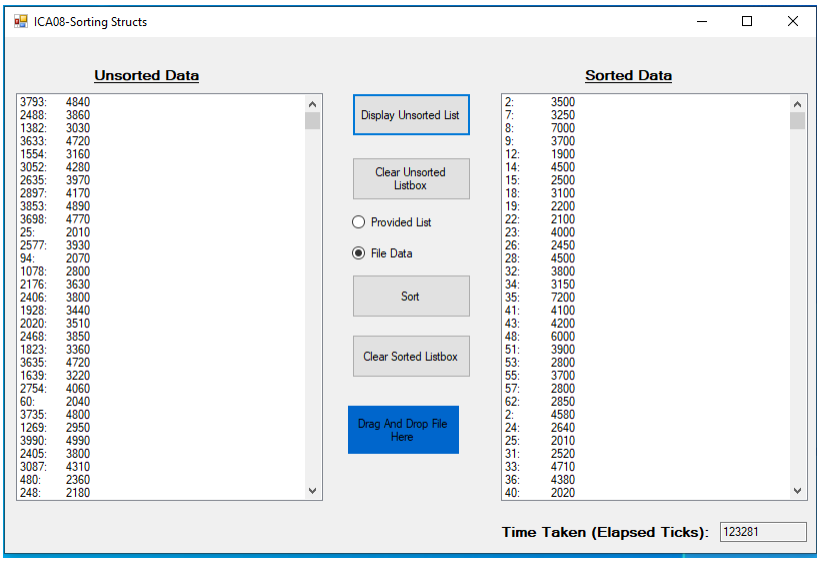
When the user clicks on the “Sort” button, the program will use the adapted sorting method to sort the list in ascending order of employee id. Again the list that will be sorted will be determined by the radio button checked. The sorted data will then be displayed in the right list box. The sorting time must be calculated (using a Stopwatch object) and displayed in the read-only textbox.

Sample runs:

1. Unsorted and sorted versions of the small list (created from the table data)



2. File data, unsorted and sorted list



Rubric: Max Marks: 30

Item	Max Marks	Penalty
UI	4	Unprofessional layout: -2 No proper tab order: -2 Using default control names: -3
Struct Properly created	4	
Unsorted data properly displayed in left List box	4	Wrong Format: -2
Provided table Data properly sorted and displayed in right list box	6	
Drag and Drop working as required. Data loaded in left listbox	4	
File data sorted and displayed	6	
Execution Time Displayed	2	
Documentation: Programmer Block Appropriate Variable Names Program Properly commented		Missing components of documentation: -1 to -6

This ICA has to use lists of structs and Quick-Sort. Otherwise it will be marked as 0..