Department of Mathematics & Computer Science - York College - CUNY

Spring 2020 : CS 351 – Algorithm Design and Analysis – Dr. Thitima Srivatanakul

Homework#2 (30/100 points)
Due: 03/10/2020 11.55pm

Instructions: Submit your solution to this assignment electronically to the Blackboard system (under Assignment->Homework#2). Submit one .cpp files, main.cpp. **Files submitted in other format will not be graded!**

WARNING AGAINST PLAGIARISM

Assignments are individual tasks. Students who submit copied code will obtain a mark of zero for the assignment and disciplinary steps may be taken. It is also unacceptable to lend your work to other students – do not make your code available to anyone! It is highly unlikely for two programmers to come up with exactly the same code with same logic and variable names.

Use the C++ code provided on the Blackboard under Assignment#2, write a complete C++ program to perform the following tasks. Note that the class Employee is in a separate Header (Employee.hpp) and implementation files (Employee.cpp). Details about this will be discussed in the class.

Under the main() function, there are code statements to display a menu of options for user. The menu contains the options that allow the user to (1) display all the employees in the list, (2) view the details of an employee, (3) add a new employee to the list, (4) remove an employee from the list, (5) sort the employee list by employee ID and (6) exit the program.

```
***** My Employee Program (CS351) *****
 1 - Display List of Employee
 2 - View Employee
 3 - Add New Employee
 4 - Remove an Employee
 5 - Sort List
 6 – Exit
 Enter your choice and press return:
```

Task 1 – Working with String – import employee list from a text file [5 points]
First, you need to import the employee list from a text file, "EmployeeData2.csv" provided in Blackboard. Each line of the file is an employee record. You need to extract each field and create an Employee object for each one and insert to the `empList`. Use std::string::substr and std::string::find for this task. After all the records are inserted to the list, call `displayEmployee(newEmp)` function to display the employee list.

*** Do not post any homework questions or the solutions on any online forum/discussion board. ***

Task 2 – Working with singly linked list – remove duplicate records [5 points]
There are a few duplicate records in the list. Your task is to remove any duplicate records from the list. Records with the same employee ID are considered as duplicates. Use `unordered_set` as a data structure to store unique employee ID that exist in the list.

Task 3 – Searching in the list – View an Employee [5 points]
When option 2 – "View Employee" is chosen, the user will be presented with a prompt to enter an employee ID. Complete the member function `Employee * find(string stringID)` of class List so that the program will display the employee based on the ID match.

Task 4– Remove a node from the list – Remove an Employee [5 points]

When option 4 – "Remove an Employee" is chosen, the user will be presented with a prompt to enter the employee ID of the employee that they want to remove.

After the user enters the employee ID, the program will remove the employee based on the ID match. Complete the member function `void removeEmployee(string stringID)` of class List.

Task 5– Sort the list using MergeSort [10 points]

Complete the code for the following member functions of class List to perform merge sort on the list. I will explain details in the class.

```
node* merge(node* a, node* b)

void findMid(node * headRef, node** front, node** back)
```