Project 1: Class Survey

CMPE 250, Data Structures and Algorithms, Fall 2017

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Description

You are going to be implementing a class survey tool where class members are stored in a LinkedList. You will be provided some initial code and you are going to implement the missing part.

The files you will be given are:

Member.h, Member.cpp, Node.h, Node.cpp, LinkedList.h, SurveyClass.h and main.cpp

The files you should write your code in is:

LinkedList.cpp, SurveyClass.cpp

In other words, you are expected to implement the methods, constructors and destructor, which are prototyped in LinkedList.h and SurveyClass.h.

Important Note: For this project, any code written outside LinkedList.cpp and SurveyClass.cpp will be meaningless for grading!

Details of the Given Code

Member

This class holds required information about a member joining the survey. It consists of a string data field for storing the name, a numeric field for storing the age and one more string field for storing the favourite color of the member. The copy constructor and destructor and some operator overloading are implemented for you.

Node

This class consists of a Member data field for storing the data and a Node pointer to the next node which will be used to construct LinkedList. The copy constructor and destructor and some operator overloading are implemented for you.

LinkedList

This is the class you will be implementing and consists of two Node instances that represent heads and tails of the list and an integer to keep the length of the list. LinkedList.h is already written for you and you are responsible for implementing LinkedList.cpp. To implement the project successfully, you are going to:

- implement a pushTail function : Adds a new node to the end of the list
- implement constructor
- implement copy constructor
- overload assignment operator
- implement destructor

SurveyClass

This is the class you will be implementing and contains a pointer to a LinkedList object, which will be used to represent the class members read. SurveyClass.h is already written for you and you are responsible for implementing SurveyClass.cpp. To implement the project successfully, you are going to:

- implement an add member function : Adds a new Member object to the linked list
- implement an age survey function : Calculates and returns the average age for the members of the class. The average age can have up to two decimal points.
- implement a color survey function : Finds the most favourite color and returns its name. The most favourite color is the color which is liked by the highest number of members.
- implement constructor
- implement copy constructor
- overload assignment operator
- implement destructor

You can of course implement additional helper functions but make sure that you do not modify other files.

main.cpp
This is the class where you will be handling the input and output. Most of the I/O coding has already been implemented. You are allowed to modify this class for your implementation tests. But remember that we will replace yours with the original for grading tests. Note that when you execute the main after removing /* and */ signs, your output must be the same as the corresponding result file.

Input & Output

Your code must be compiled by the simple cmake CMakeLists.txt and make commands and your code must read the arguments from the command line. Your code will be tested with the command:

./project1 inputFile outputFile

Input

Your program should read the input from the file which is given as an argument while executing the program from the terminal. Input file will contain the number of members in the first line and followed by multiple member information lines. A member information line contains 3 fields separated by a single space: the name of the member, the age, the favourite color. An example format is shown below:

N

Name1 Age1 Color1

...

NameN AgeN ColorN

Output

Similar to the input, your program will output to the file specified from the terminal. The output file will contain two lines. The first line contains the average age of the members. The second lin contaions the name of the most favourite color.

Important Note: No new line after the last color line. Note that this may result in wrong evaluations since it will be done automatically.

Examples

Input	**Output**
3 Ali 15 Blue Ece 25 Purple Ahmet 17 Purple	19.00 Purple

6 Ali 15 Blue Ece 25 Purple Ahmet 17 Purple Veli 22 Yellow Samet 19 Blue Hakan 31 Blue	21.50 Blue

Warnings

1. You are not allowed to use any library or object provided by C++ for analyzing a LinkedList. You will get zero in this case.

2. You are expected to implement copy constructor and destructor, and overload assignment operator. Otherwise, when extensively tested, your code will very likely give segmentation fault and crash even though the addition and multiplication operations are just fine.

3. Make sure that an executable is created after executing cmake CMakeLists.txt and make commands. Otherwise, no executable will be created and your code will fail in grading.

Submission Details

You are supposed to use the Github Classroom system provided to you for all projects. No other type of submission will be accepted.

Also pay attention to the following points:

- All source codes are checked automatically for similarity with other submissions and exercises from previous years. Make sure you write and submit your own code.
- In our case, you are expected to use C++ as powerful, steady and exible as possible.
- Use mechanisms that affects these issues positively.
- Make sure you document your code with necessary inline comments, and use meaningful variable names. Do not over-comment, or make your variable names unnecessarily long.