Test 2 Programming Component (40 pts)

Problem One (20 pts)

Write a program (**list.cpp**) to manage a linked list of clients for a vet. Each client has a name (string), a pet (string), and an account balance (float). A client should be a struct. Each node in the list should represent one client, i.e., the data type in the list node is of a struct type representing a client. Your program should create the list of clients by reading in all data for each client from a file "clients.dat". The list should be created as a **sorted list** based on client name. Finally the program should traverse the sorted list and print all data for each client. For example, one run of a program might be:

For example, if the file clients.dat contained:
          TJohnson Retriever 32.56
          JSmith Cat 524.35
          ABledsoe Python 432.32
          LJames Parrot 256.75
          FDouglas Ferret 0.0

The program should print (note: the clients printed are in ascending order of client names):
          ABledsoe Python 432.32
          FDouglas Ferret 0.0
          JSmith Cat 524.35
          LJames Parrot 256.75
          TJohnson Retriever 32.56

Copy the datafile to your project folder: **cp   ~cen/data/clients.dat   .**

Problem Two (20pts)

Write a class (car.h and car.cpp) that describes a car. A car has the following data members – all private:
          string make
          string model
          float dealerCost
          float retailPrice

A car also has public methods:
   • default constructor to set the dealerCost and retailPrice to 0.0
   • constructor that sets the dealerCost and retailPrice when a car variable is declared
   • void setMembers //assigns the values of make, model, and dealerCost
   • void printMembers //prints all data member values
   • void calculatePrice //uses the float argument to calculate the retail price
                    //e.g., if the argument is 0.15, then that means that
                    //the retailPrice would be dealerCost + 0.15*dealerCost

The client program (main.cpp) should do the following:

Read the cars from the file "cars.dat". You will need to read to end of file. Then read the percent upcharge. The main program should handle up to 100 cars (an array of cars). The retailPrice will need to be calculated for each car after reading the percent upcharge. Finally print out all the info on each of the cars.

Copy the datafile into the project folder with: cp   ~cen/data/cars.dat .

For example, if cars.dat contained:
        Honda Civic 20136
        Honda Accord 23307
        Honda Odyssey 33034

Your program should output:

Input the percent upcharge: .07   ←*this is to prompt the user to enter the percent upcharge from user*

Make	Model	Dealer Price	Retail Price
Honda	Civic	$20136	$21545
Honda	Accord	$23307	$24938
Honda	Odyssey	$33034	$35346

Hand in the programs with the following command:

handin test3 list.cpp   car.h car.cpp main.cpp