

Sultan Qaboos University

Department of Computer Science

COMP2102 Problem Solving and Programming, Spring 2102

Assignment 5: Linked List Application

Due date: Mon 14/05/2012 @ 11:55 PM

Write a C++ program that uses dynamic linked implementation to store and manipulate a list of property records (i.e. structures) uploaded from a data file. The linked list is built using a self-referential structure named **Property** where each property record is linked to the next property record in the list. A property record stores the following information about a property:

Member	Member data type
property id	String
property type	Integer 0 (for a flat) or 1 for (House)
number of rooms in property	Integer
property location	String representing the city name in which the property is located. Assume a single word city name.
property price	Floating point value

The records are kept in a text file named "property.txt" in the order property id, property type, number of rooms, price and location. A sample data file is shown below:

P1	0	3	250	Khod
P2	0	2	200	Khod
P3	0	3	300	Bowsher
P4	1	5	1200	Azaiba
P5	1	4	600	Ansab
P6	0	3	400	Goubra
P7	1	5	500	Seeb

Write a menu-driven program with the following operations:

- **View available properties**
Displays all properties records currently in the list
- **Add new property**
Adds a new property record to the front of the list
- **Delete a property**
Removes a property record from the list using its id value
- **Update a property**
Searches for a property using its id and then allows the user to update the property information.
- **Search for a property**
Searches for a property using its id and then displays on screen the property information.
- **Save properties**
Writes all properties information from the linked list back to the text file in the originally entered format.

Important considerations:

- Create a synonym for the Property data type called **Node**. Use **Node** type for all the implementation of the linked list operations.
- Give an "Exit" menu option to the user to terminate the program.
- Your program should read property records from the text file into a linked list data structure when it starts execution, and, before it exists, write the records from the linked list structure to the same data file overwriting the old content of the data file.
- Use recursive approach to implement the following operations:
 - Printing the linked list on the screen
 - Searching for a property in the list
- Include an operation to purge(i.e. delete the entire linked list).

See the next page.....

Create and use functions with the following prototypes:

```
void FileToList(Node *&);
void ListToFile(Node *);
void AddProperty(Node * &);
void DeleteProperty(Node *&, string);
void PrintAll(Node *); //Recursive function
Node *SearchProperty(Node *, string); //Recursive function
void Update(Node *&);
void Search(Node *&) ;
void menu(char&);
void Purge(Node *&);
```

Functions Search and Update call function SearchProperty (...) to return the address of the structure containing a given property using its id. If the id is not in the list a null (i.e. 0) value is returned.

Write any additional functions you feel are necessary.

Sample Run:

Use the provided executable to get a feeling of how the program works and what it does.

Grading Table:

Task	Marks	Comment
Proper submission and style	/5	
Loading data from text file into linked list	/10	
Saving data to text file	/5	
Adding to List	/10	
Deleting from List	/10	
Printing List	/5	
Searching for a property	/10	
Updating a property	/10	
Use of recursion in Print and SearchProperty	/10	
Error free	/10	
Purging the list	/5	
Function main logic	/10	
Total	/100	

Submission Policies

- Name your program as A5_XXXXX where XXXXX is your university ID.
- Upload only your .cpp solution program to Assignment 5 link in Moodle.
- Late Submission and copying policies will be applied as described in the course outline.