# Lab 3-2 Linked List Requirement Details

The focus of these problems will be working with information extracted from a municipal government data feed containing bids submitted for auction of property. The data set is provided in two comma-separated files:

1. eBid\_Monthly\_Sales.csv (larger set of 17,937 bids)
2. eBid\_Monthly\_Sales\_Dec\_2016.csv (smaller set of 179 bids)

This assignment is designed to explore linked lists so you will implement a singly linked-list to hold a collection of bids loaded from a CSV file. We will build a simple console program that uses a menu to enable testing of the logic you will complete. In this version the following menu is presented when the program is run:

**Menu:**

**1. Enter a Bid**

**2. Load Bids**

**3. Display All Bids**

**4. Find Bid**

**5. Remove Bid**

**9. Exit**

**Enter choice:**

The LinkedList.cpp program is partially completed - it contains empty methods representing the programming interface used to interact with the linked list. You will need to add logic to the methods to implement the necessary behavior. Here is the public API for LinkedList that you have to complete:

public:

LinkedList();

virtual ~LinkedList();

void Append(Bid bid);

void Prepend(Bid bid);

void PrintList();

void Remove(string bidId);

Bid Search(string bidId);

You will need to perform the following steps to complete this activity:

Setup: Begin by creating a new C++ Project with a Project Type of "Hello World C++ Project"

1. Name the project 'LinkedList', remember to pick the correct compiler in **Toolchains** and click Finish. This will create a simple LinkedList.cpp source file under the **/src** directory.
2. Download the starter program files and copy them to the project’s **/src** directory, replacing the existing auto-generated one. Remember to right-click on the project in the Project Explorer pane on the left and **'Refresh'** the project so it adds all the new files to the src folder underneath.
3. Because this activity uses C++ 11 features you must follow the instructions under “C++ Compiler Version” in the *C++ Development Installation guide* to add **-std=c++11** compiler switch to the Miscellaneous settings.

Task 1: Internal structure for list entries, housekeeping variables.

Create the structure, internal to the class, that will hold the bid entries. Consider what other variables are needed to help manage the list.

Task 2: Initialize housekeeping variables.

Remember to initialize the housekeeping variables in the constructor.

Task 3: Implement append logic.

Create logic to append a bid to the end of the list.

Task 4: Implement prepend logic.

Create logic to prepend a bid to the front of the list.

Task 5: Implement print logic.

Create logic to print all the bid entries in the list to the console.

Task 6: Implement remove logic.

Create logic to remove the requested bid using the bid Id passed in.

Task 7: Implement search logic.

Create logic to search for the requested bid using the bid Id passed in. Return the bid structure if found or an empty bid structure if not found.

Here is sample output from running the completed program:

| **Example Input** | **Choice: 2** | **Choice: 3** |
| --- | --- | --- |
| **Display** | Menu:  1. Enter a Bid  2. Load Bids  3. Display All Bids  4. Find Bid  5. Remove Bis  9. Exit  Enter choice: 2 | Menu:  1. Enter a Bid  2. Load Bids  3. Display All Bids  9. Exit  Enter choice: 3 |
| **Output** | Loading CSV file eBid\_Monthly\_Sales\_Dec\_2016.csv  179 bids read  time: 2993 clock ticks  time: .002993 seconds | Hoover Steam Vac | 27 | Enterprise  Table | 6 | General Fund  ...  ...  5 Chairs | 19 | General Fund  2 Chairs | 20 | General Fund  Chair | 71.88 | General Fund |

| **Example Input** | **Choice: 4** | **Choice: 5** |
| --- | --- | --- |
| **Display** | Menu:  1. Enter a Bid  2. Load Bids  3. Display All Bids  4. Find Bid  5. Remove Bis  9. Exit  Enter choice: 4 | Menu:  1. Enter a Bid  2. Load Bids  3. Display All Bids  4. Find Bid  5. Remove Bis  9. Exit  Enter choice: 5 |
| **Output** | 98109: Whirlpool Washer & Dryer | 225.46 | Enterprise  time: 47 clock ticks  time: .000047 seconds | {no output shown} |

| **Example Input** | **Choice: 4** | **Choice: 9** |
| --- | --- | --- |
| **Display** | Menu:  1. Enter a Bid  2. Load Bids  3. Display All Bids  4. Find Bid  5. Remove Bis  9. Exit  Enter choice: 4 | Menu:  1. Enter a Bid  2. Load Bids  3. Display All Bids  4. Find Bid  5. Remove Bis  9. Exit  Enter choice: 9 |
| **Output** | Bid Id 98109 not found.  time: 23 clock ticks  time: .000023 seconds | Good bye. |