```
Script started on 2024-04-05 15:32:28-05:00 [TERM="xterm-256color" TTY="/dev/pts/0" COLUMNS="308" LINES="65"]
[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_18[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_18[00m$ pwd
[?2004l
/home/jovyan/CS2/Lab/Lab_18
[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_18[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_18[00m$ ls -la
[?2004l
total 48
drwxr-sr-x  3 jovyan users  4096 Apr  5 15:32 [0m[01;34m.[0m
drwxr-sr-x 19 jovyan users  4096 Apr  4 13:40 [01;34m..[0m
drwxr-sr-x  2 jovyan users  4096 Apr  4 14:48 [01;34m.ipynb_checkpoints[0m
-rwxr-xr-x  1 jovyan users 18536 Apr  4 17:04 [01;32mlink[0m
-rw-r--r--  1 jovyan users  2747 Apr  5 15:32 LinkedListV2.cpp
-rw-r--r--  1 jovyan users   719 Apr  4 13:41 LinkedListV2.h
-rw-r--r--  1 jovyan users  1101 Apr  5 15:27 ll_test_V2.cpp
-rw-r--r--  1 jovyan users     0 Apr  5 15:32 Sabin_Lab_18.log
-rw-r--r--  1 jovyan users    39 Apr  4 14:47 testfile.dat
[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_18[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_18[00m$ cat -n
LinkedListV2.cpp[K[K[Kh
[?2004l
     1	#ifndef _LINKEDLIST_H
     2	#define _LINKEDLIST_H
     3	
     4	// A structure defining the node.
     5	struct Node {
     6	
     7	  int data;    // some data
     8	  Node *next;  // Pointer to another Node
     9	};
    10	
    11	class LinkedList {
    12	private:
    13	  Node *head; // pointer to first item in list
    14	
    15	public:
    16	  LinkedList();               // How do I initialize my object?
    17	  void push_back(int value);  // add elements to the end of our LL
    18	  void print() const;         // print all elements
    19	  void push_front(int value); // push to front
    20	  bool empty() const;         // function to determine if list is empty
    21	  void remove(int value);     // function to remove a value
    22	  Node *find(int value);      // function to find a node with a value (nullptr if not found)
    23	};
    24	
    25	#endif[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_18[01;32mjovyan@jupyter-
tes4j[00m:[01;34m~/CS2/Lab/Lab_18[00m$ cat -n LinkedListV2.cpp
[?2004l
     1	#include "LinkedListV2.h"
     2	#include <iostream>
     3	
     4	// TODO: Implement the functions below.
     5	LinkedList::LinkedList() {
     6	    head = nullptr;
     7	}
     8	
     9	void LinkedList::print() const {
    10	    if(empty()){
    11	        std::cout << "ERROR: empty list...\n";
    12	    }else{
    13	        Node *temp = head;
    14	        std::cout << "Data:\n";
    15	        while(temp != nullptr){
    16	            std::cout << temp->data << '\n';
    17	            temp = temp->next;
    18	        }
    19	    }
    20	    std::cout << '\n';
    21	}
    22	
    23	void LinkedList::push_front(int value) {
    24	    Node *newNode = new Node;
    25	    newNode->data = value;
    26	    newNode->next = head;
    27	    head = newNode;
    28	}
    29	
    30	void LinkedList::push_back(int value) {
    31	    Node *newNode = new Node;
    32	    newNode->data = value;
    33	    newNode->next = nullptr;
    34	    if(head == nullptr){
    35	        head = newNode;
    36	    }else{
    37	        Node *temp = head;
    38          while(temp->next != nullptr){
    39              temp = temp->next;
    40          }
    41          temp->next = newNode;
    42      }
    43  }
    44  
    45  void LinkedList::remove(int value){
    46      //Set the address value to the found variable
    47      Node *address = find(value);
    48      //If it is null, then the value does not exist
    49      if(address == nullptr){
    50          std::cout << "ERROR: " << value << " not found, could not remove...\n";
    51          return;
    52      }else{
    53          //Set two temp nodes, one of them should trail
    54          Node *cur = head;
    55          Node *prev = nullptr;
    56          //Loop until the address is the correct one
    57          while(cur != address){
    58              //Move up both
    59              prev = cur;
    60              cur = cur->next;
    61          }
    62          //If it is the first node in the list
    63          if(prev == nullptr){
    64              //Set head to the 2nd node in the list
    65              head = cur->next;
    66          }else if(cur->next != nullptr){
    67              //If the next address for the node is not a nullptr
    68              //Set the prev to what the 'next' of the cur is looking at
    69              prev->next = cur->next;
    70          }else{
    71              //Must be the last node, so the prev should look to a nullptr
    72              prev->next = nullptr;
    73          }
    74          //delete the node
    75          delete cur;
    76      }
    77  }
    78  
    79  Node *LinkedList::find(int value){
    80      //Set variables for a temp node, and data_value
    81      Node *temp = head;
    82      int data_value{};
    83      //Loop until it is a nullptr or we find the correct address of the data value
    84      while(temp != nullptr){
    85          //Store the data in the temp variable
    86          data_value = temp->data;
    87          //See if it equals the value inputted
    88          if(data_value == value){
    89              //Return the address
    90              return temp;
    91          }
    92          //Move to the next node
    93          temp = temp->next;
    94      }
    95      //Since it did not find the value, return null
    96      return nullptr;
    97  }
    98  
    99  bool LinkedList::empty() const {
   100      return head == nullptr;
   101  }
   102  
[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_18[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_18[00m$ cat -n
ll_test_V2.cpp
[?2004l
     1  /*
     2  Tyler Sabin
     3  Section 004
     4  Lab 18
     5  In this lab we will continue to work with
     6  Linked lists and make a find, and remove
     7  function
     8  */
     9  
    10  #include "LinkedListV2.h"
    11  #include <fstream>
    12  #include <iostream>
    13  
    14  int main() {
    15    std::string filename;
```

```
  std::cout << "Enter a data file: ";
  std::cin >> filename;
  std::ifstream datafile;
  datafile.open(filename);
  if (!datafile) {
    std::cout << "ERROR: " << filename << " could not open...\n";
    return 0;
  }
  std::cout << '\n';
  LinkedList values;
  int value;
  int count{0};
  values.print();
  datafile >> value;
  while (datafile) {
    values.push_back(value);
    count++;
    datafile >> value;
  }
  datafile.close();
  values.print();
  values.remove(504); // remove the last item
  values.print();
  values.remove(667); // remove the first item
  values.print();
  values.remove(68); // remove a middle item
  values.print();
  values.remove(3);   // remove a non-existant item
  values.remove(441); // remove the last item
  values.remove(891); // remove another middle item
  values.remove(67);  // remove another front item
  values.print();
}[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_18[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_18[00m$
g++ -Wall -Wextra -Werror ll_test_V2.cpp LinkedListV2.cpp -o test
[?2004l
[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_18[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_18[00m$ ./test
[?2004l
Enter a data file: testfile.dat

ERROR: empty list...

Data:
667
67
248
68
891
778
228
162
441
504

Data:
667
67
248
68
891
778
228
162
441

Data:
67
248
68
891
778
228
162
441

Data:
67
248
891
778
228
162
441
```

```
ERROR: 3 not found, could not remove...
Data:
248
778
228
162

[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_18[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_18[00m$ ./test
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```

```
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441

ERROR: 3 not found, could not remove...
```

```
Data:
248
778
228
162

[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_18[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_18[00m$ ./test
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ERROR: 3 not found, could not remove...
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[?2004h(base) ]0;jovyan@jupyter-tes4j: ~/CS2/Lab/Lab_18[01;32mjovyan@jupyter-tes4j[00m:[01;34m~/CS2/Lab/Lab_18[00m$ exit
[?2004l
exit

Script done on 2024-04-05 15:34:13-05:00 [COMMAND_EXIT_CODE="0"]
```