```
Script started on 2023-11-30 21:23:38+00:00 [TERM="xterm-256color" TTY="/dev/pts/0" COLUM
NS="81" LINES="97"]
\[\033[01;34m\]\w\[\033[00m\]$ pwd
/home/runner/Lab-21-Introduction-to-Recursion-kcp3s
\[\033[01;34m\]\w\[\033[00m\]$ ls -la
total 1296
drwxr-xr-x 1 runner runner     316 Nov 30 21:23 .
drwxrwxrwx 1 runner runner     128 Nov 30 21:13 ..
-rwxr-xr-x 1 runner runner   18200 Nov 30 21:22 a.out
-rw-r--r-- 1 runner runner      17 Oct 27 20:51 .breakpoints
drwxr-xr-x 1 runner runner      18 Nov 30 14:21 .cache
drwxr-x--- 1 runner runner     478 Nov 30 18:54 .ccls-cache
drwxr-xr-x 1 runner runner      68 Nov 30 21:14 .lesson
-rw-r--r-- 1 runner runner    1887 Nov 30 21:22 LinkedList.cpp
-rw-r--r-- 1 runner runner     399 Nov 30 14:36 LinkedList.h
-rw-r--r-- 1 runner runner     956 Nov 30 19:32 main.cpp
-rwxr-xr-x 1 runner runner 1255712 Oct 27 20:53 main-debug
-rw-r--r-- 1 runner runner     449 Oct 27 20:53 Makefile
-rw------- 1 runner runner     971 Nov 30 14:35 paragraph.txt
-rw-r--r-- 1 runner runner       0 Nov 30 21:23 Patel_Lab_21.log
-rw-r--r-- 1 runner runner    1426 Dec 21  2022 .replit
-rw-r--r-- 1 runner runner     117 Nov 30 14:21 replit.nix
-rw------- 1 runner runner     164 Nov 30 14:35 sample.txt
-rw------- 1 runner runner      15 Nov 30 14:35 short.txt
\[\033[01;34m\]\w\[\033[00m\]$ cat -n main.cpp
     1  #include "LinkedList.h"
     2  #include <fstream>
     3  #include <iostream>
     4  #include <string>
     5  int main() {
     6    LinkedList mylist;
     7    std::ifstream textfile;
     8    std::string filename;
     9    std::cout << "Enter filename: ";
    10    std::cin >> filename;
    11    std::cout << '\n';
    12    textfile.open(filename);
    13    if (!textfile) {
    14      std::cout << "Invalid filename...\n";
    15      return 0;
    16    }
    17    std::string text;
    18    textfile >> text;
    19    while (textfile) {
    20      mylist.push_back(text);
    21      textfile >> text;
    22    }
    23    std::cout << "--- Display Forward ---\n";
    24    mylist.display();
    25    std::cout << '\n';
    26    // TODO: Uncomment these lines as you implement the appropriate functions. The
    27    // final submission should have all of these lines uncommented.
    28      std::cout <<"--- Display Recursive Forward ---\n";
    29    mylist.display_recursive(mylist.get_head());
    30    std::cout << '\n';
    31    std::cout << "--- Display Recursive Reversed --\n";
    32    mylist.display_reverse(mylist.get_head());
    33    std::cout << '\n';
    34
    35    return 0;
    36  }\[\033[01;34m\]\w\[\033[00m\]$ cat -n LinkedList.h
     1  #ifndef _LINKEDLIST_H
     2  #define _LINKEDLIST_H
     3  #include <string>
     4
     5  struct Node {
     6    std::string m_text;
     7    Node *next;
     8  };
     9
```

```
10  class LinkedList {
11  private:
12    Node *head;
13
14  public:
15    LinkedList();
16    ~LinkedList();
17    Node *get_head();
18    bool empty() const;
19    void push_back(std::string text);
20    void display() const;
21    void display_reverse(Node *curr) const;
22    void display_recursive(Node *curr) const;
23  };
24
25  #endif\[\033[01;34m\]\w\[\033[00m\]$ cat -n LinkedList.cpp
 1  #include "LinkedList.h"
 2  #include <iostream>
 3  #include <string>
 4
 5  LinkedList::LinkedList() {
 6    head = nullptr; // make sure head is null
 7  }
 8  bool LinkedList::empty() const {
 9    // it's empty if head is a nullptr
10    return head == nullptr;
11  }
12  void LinkedList::push_back(std::string text) {
13    // Create a new Node and store the text in it
14    Node *to_add = new Node;
15    to_add->m_text = text;
16    to_add->next = nullptr;
17    // If it's empty, make the head point to the new node
18    if (empty()) {
19      head = to_add;
20      return;
21    }
22    // otherwise, traverse to the end
23    Node *curr{head};
24
25    while (curr->next != nullptr) {
26      curr = curr->next;
27    }
28    // connect the last node to the new one
29    curr->next = to_add;
30  }
31
32  Node *LinkedList::get_head() { return head; }
33
34  void LinkedList::display() const {
35    // get a temporary pointer to start at head
36    Node *curr{head};
37    // as long as it isn't a null ptr
38    while (curr != nullptr) {
39      // display the text
40      std::cout << curr->m_text << " ";
41      // move current to the next node in the list
42      curr = curr->next;
43    }
44  }
45
46  // TODO: Implement display_recursive to print the list
47  //       forward using recursion
48  void LinkedList::display_recursive(Node *curr)const{
49
50      if(curr == nullptr){
51
52          return;
53      } else{
54          std::cout << curr->m_text << " ";
```

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    55          display_recursive(curr->next);
    56      }
    57
    58
    59
    60  }
    61
    62  // TODO: Implement display_reverse using recursion
    63  void LinkedList::display_reverse(Node *curr)const{
    64
    65      if(curr == nullptr){
    66          return;
    67      }else{
    68          display_reverse(curr->next);
    69          std::cout << curr->m_text << " ";
    70      }
    71
    72
    73  }
    74  // TODO: Implement the destructor for the Linked List using an
    75  //       iterative (NOT recursive approach)
    76  LinkedList::~LinkedList(){
    77        Node *curr, *nextone;
    78
    79      curr = head;
    80      while(curr){
    81          nextone = curr->next;
    82          delete curr;
    83          curr = nextone;
    84      }
    85  }\[\033[01;34m\]\w\[\033[00m\]$ g++ main.cpp LinkedList.cpp -o driver
\[\033[01;34m\]\w\[\033[00m\]$ ./driver
Enter filename: short.txt

--- Display Forward ---
This is a test.
--- Display Recursive Forward ---
This is a test.
--- Display Recursive Reversed --
test. a is This
\[\033[01;34m\]\w\[\033[00m\]$ ./driver
Enter filename: sample.txt

--- Display Forward ---
In the year 2150, on the distant exoplanet Epsilon Prime, a team of interstellar scientis
ts uncovered a mysterious quantum anomaly beneath the planet’s icy surface.
--- Display Recursive Forward ---
In the year 2150, on the distant exoplanet Epsilon Prime, a team of interstellar scientis
ts uncovered a mysterious quantum anomaly beneath the planet’s icy surface.
--- Display Recursive Reversed --
surface. icy planet’s the beneath anomaly quantum mysterious a uncovered scientists inter
stellar of team a Prime, Epsilon exoplanet distant the on 2150, year the In
\[\033[01;34m\]\w\[\033[00m\]$ ./driver
Enter filename: paragraph.txt

--- Display Forward ---
In the year 2150, on the distant exoplanet Epsilon Prime, a team of interstellar scientis
ts uncovered a mysterious quantum anomaly beneath the planet’s icy surface. The anomaly,
a pulsating crystalline structure known as a "time lattice," emitted faint signals that h
inted at its ability to manipulate the fabric of spacetime itself. As the team delved dee
per into their research, they discovered that the lattice acted as a gateway to alternate
 timelines. Desperate to unlock its secrets, they constructed a cutting-edge quantum inte
rface that allowed them to peer into these divergent realities. However, the consequences
 of their experiments were far-reaching, as the time lattice began to exhibit unpredictab
le behavior, causing temporal distortions that rippled across Epsilon Prime. Now, the sci
entists must navigate the ever-shifting landscape of past and future, seeking a way to st
abilize the time lattice before it unleashes irreversible chaos upon the cosmos.
--- Display Recursive Forward ---
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--- Display Recursive Reversed --
cosmos. the upon chaos irreversible unleashes it before lattice time the stabilize to way
 a seeking future, and past of landscape ever-shifting the navigate must scientists the N
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 to gateway a as acted lattice the that discovered they research, their into deeper delve
d team the As itself. spacetime of fabric the manipulate to ability its at hinted that si
gnals faint emitted lattice," "time a as known structure crystalline pulsating a anomaly,
 The surface. icy planet’s the beneath anomaly quantum mysterious a uncovered scientists
interstellar of team a Prime, Epsilon exoplanet distant the on 2150, year the In
\[\033[01;34m\]\w\[\033[00m\]$ exit

Script done on 2023-11-30 21:25:23+00:00 [COMMAND_EXIT_CODE="0"]