Class Demo Singly Linked List

0.1.0

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Chapter 1

Class Index

1.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 2

File Index

2.1 File List

Here is a list of all files with brief descriptions:

Chapter 3

Class Documentation

3.1 Node Class Reference

Collaboration diagram for Node:

Public Member Functions

- Node (int d)

Public Attributes

- int data
- Node * nextNode

3.1.1 Detailed Description

Definition at line 13 of file main.cpp.

3.1.2 Constructor & Destructor Documentation

3.1.2.1 Node()

```
Node::Node (
            int d )  [inline]
```

Constructor

Definition at line 21 of file main.cpp.

```
21                  {
22          data = d;
23          nextNode = NULL;
24      }
```

3.1.3 Member Data Documentation

3.1.3.1 data

```
int Node::data
```

Definition at line 15 of file main.cpp.

3.1.3.2 nextNode

```
Node* Node::nextNode
```

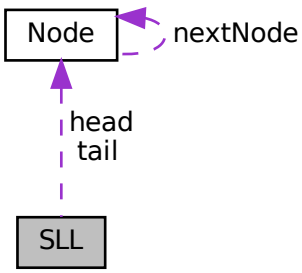
Definition at line 16 of file main.cpp.

The documentation for this class was generated from the following file:

- /home/brandon/CPTR227/LinkedLists/LinkedLists/src/main.cpp

3.2 SLL Class Reference

Collaboration diagram for SLL:



Public Member Functions

- SLL ()
- bool addToTail (int d)
- int get (int ii)
- bool addMiddle (int ii, int d)
- bool removeHead (int &d)
- void printList ()

Public Attributes

- Node * head
- Node * tail
- int n

3.2.1 Detailed Description

Definition at line 27 of file main.cpp.

3.2.2 Constructor & Destructor Documentation

3.2.2.1 SLL()

```
SLL::SLL ( )  [inline]
```

Constructor

Definition at line 36 of file main.cpp.

```
36           {
37         head = NULL;
38         tail = NULL;
39         n = 0;
40     }
```

3.2.3 Member Function Documentation

3.2.3.1 addMiddle()

```
bool SLL::addMiddle (
             int ii,
             int d )  [inline]
```

Adds node after the iith node

Parameters

ii	the node to insert after
d	the data in the new node

Returns

true if successful

Definition at line 90 of file main.cpp.

```
90                                  {
91          Node* curNode;
92          Node* newNode = new Node(d);
93          if(head == NULL) { // the list is empty
94              return(false);
95          } else if(ii >= n) {
96              cout « "ERROR: Asked for node beyond tail" « endl;
97              return(false);
98          } else if(ii < 0) {
99              cout « "ERROR: Asked for negative index" « endl;
100              return(false);
101          } else {
102              curNode = head;
103              // traverse list to desired node
104              for(int jj = 0; jj < ii; jj++) {
105                  curNode = curNode->nextNode;
106              }
107              // At this point curNode points to the node we want to add after
108              newNode->nextNode = curNode->nextNode;
109              curNode->nextNode = newNode;
110              n++;
111              return(true);
112          }
113      }
```

3.2.3.2 addToTail()

```
bool SLL::addToTail (
              int d )  [inline]
```

Adds node to tail of list

Definition at line 45 of file main.cpp.

```
45                              {
46          Node* newNode = new Node(d);
47          if(n == 0) { // the list is empty
48              head = newNode;
49              tail = newNode;
50          } else {
51              tail->nextNode = newNode; // update the last node's next node to newNode
52              tail = newNode; // update the tail pointer to newNode
53          }
54          n++;
55          return(true);
56      }
```

3.2.3.3 get()

```
int SLL::get (
              int ii )  [inline]
```

Returns the data from the iith node

Parameters

ii	the number of the node to collect data from

Definition at line 63 of file main.cpp.

```
63                      {
64          Node* curNode;
65          if(head == NULL) { // the list is empty
66              return(-999999);
67          } else if(ii >= n) {
68              cout « "ERROR: Asked for node beyond tail" « endl;
69              return(-999998);
70          } else if(ii < 0) {
71              cout « "ERROR: Asked for negative index" « endl;
72              return(-999997);
73          } else {
74              curNode = head;
75              // traverse list to desired node
76              for(int jj = 0; jj < ii; jj++) {
77                  curNode = curNode->nextNode;
78              }
79              return(curNode->data);
80          }
81      }
```

3.2.3.4 printList()

```
void SLL::printList ( )  [inline]
```

Prints the list to stdout

Definition at line 140 of file main.cpp.

```
140                     {
141          Node* curNode;
142          if(head == NULL) { // the list is empty
143              cout « "Empty list" « endl;
144          } else { // the list is not empty
145              curNode = head; // start at the beginning
146              while(curNode->nextNode != NULL){
147                  cout « curNode->data « " -> ";
148                  curNode = curNode->nextNode; // update to next node
149              }
150              cout « curNode->data;
151              cout « endl;
152          }
153      }
```

3.2.3.5 removeHead()

```
bool SLL::removeHead (
            int & d )  [inline]
```

Removes the head node and returns the data value from the removed node

Parameters

d	pointer to integer to return value

Returns

true if successful

Definition at line 121 of file main.cpp.

```
121                             {
122         int val;
123         Node* old; // save off the old node
124         if(head != NULL) {
125             val = head->data; // collect the data from node to be removed
126             old = head; // save off pointer to node we are removing
127             head = head->nextNode; // update head to new node
128             delete old; // release the memory from the removed node
129             n--; // decrement n to show shorter list
130             d = val;
131             return(true);
132         } else { //list is empty
133             return(false);
134         }
135     }
```

3.2.4 Member Data Documentation

3.2.4.1 head

```
Node* SLL::head
```

Definition at line 29 of file main.cpp.

3.2.4.2 n

```
int SLL::n
```

Definition at line 31 of file main.cpp.

3.2.4.3 tail

```
Node* SLL::tail
```

Definition at line 30 of file main.cpp.

The documentation for this class was generated from the following file:

- /home/brandon/CPTR227/LinkedLists/LinkedLists/src/main.cpp

Chapter 4

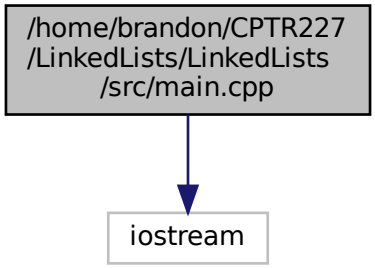
File Documentation

4.1 /home/brandon/CPTR227/LinkedLists/LinkedLists/src/main.cpp File Reference

This is a demo of making a singly linked list.

```
#include <iostream>
```

Include dependency graph for main.cpp:



Classes

- class Node
- class SLL

Functions

- int main (int, char **)

4.1.1 Detailed Description

This is a demo of making a singly linked list.

Based on ODS book examples

Author

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Date

2021 February 08

4.1.2 Function Documentation

4.1.2.1 main()

```
int main (
              int ,
              char **  )
```

Definition at line 156 of file main.cpp.

```
156                       {
157     SLL myList;
158     int retData; // for data from remove
159 
160     myList.printList();
161     myList.addToTail(1);
162     myList.printList();
163     myList.addToTail(2);
164     myList.printList();
165     myList.addToTail(3);
166     myList.printList();
167     myList.addToTail(4);
168     myList.printList();
169     myList.addToTail(5);
170     myList.printList();
171 
172     cout << "get(0) = " << myList.get(0) << endl;
173     cout << "get(1) = " << myList.get(1) << endl;
174     cout << "get(4) = " << myList.get(4) << endl;
175     cout << "get(5) = " << myList.get(5) << endl;
176     cout << "get(7) = " << myList.get(7) << endl;
177     cout << "get(-3) = " << myList.get(-3) << endl;
178 
179     myList.addMiddle(3,10);
180     myList.printList();
181     myList.addMiddle(3,11);
182     myList.printList();
183     myList.addMiddle(6,12);
184     myList.printList();
185     myList.addMiddle(0,13);
186     myList.printList();
187 
188 
189     if(myList.removeHead(retData))
190         cout << "Removed " << retData << endl;
191     else
192         cout << "list was empty" << endl;
193     myList.printList();
194     if(myList.removeHead(retData))
195         cout << "Removed " << retData << endl;
196     else
197         cout << "list was empty" << endl;
198     myList.printList();
```

```
199     if(myList.removeHead(retData))
200         cout « "Removed " « retData « endl;
201     else
202         cout « "list was empty" « endl;
203     myList.printList();
204     if(myList.removeHead(retData))
205         cout « "Removed " « retData « endl;
206     else
207         cout « "list was empty" « endl;
208     myList.printList();
209     if(myList.removeHead(retData))
210         cout « "Removed " « retData « endl;
211     else
212         cout « "list was empty" « endl;
213     myList.printList();
214     if(myList.removeHead(retData))
215         cout « "Removed " « retData « endl;
216     else
217         cout « "list was empty" « endl;
218     myList.printList();
219     if(myList.removeHead(retData))
220         cout « "Removed " « retData « endl;
221     else
222         cout « "list was empty" « endl;
223     myList.printList();
224     if(myList.removeHead(retData))
225         cout « "Removed " « retData « endl;
226     else
227         cout « "list was empty" « endl;
228     myList.printList();
229 }
```

Index