

```

(lldb) frame variable
(Node<std::basic_string<char, std::char_traits<char>, std::allocator<char> > > *) this = 0x000000000208000
(const std::basic_string<char, std::char_traits<char>, std::allocator<char> > &) new_entry = "apples": {
  __r_ = {
    std::__1::__compressed_pair_elem<std::__1::basic_string<char, std::char_traits<char>, std::allocator<char> >::__1_rep, 0, false> = {
      __value_ = {
        __l = {
          __cap_ = 32481138739011852, __size_ = 4294976821, __data_ = "\xf0?"
        }
        __s = {
          __size_ = '\f', __lx = '\f'
        }
        __data_ = "apples"
      }
      __r = {
        __words = ([0] = 32481138739011852, [1] = 4294976821, [2] = 12952811632)
      }
    }
  }
}
}
}
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002c7f Lab05`Node<std::__1::basic_string<char, std::char_traits<char>, std::allocator<char> > >::__1::Node<this=0x000000000208000, new_entry="apples"> at Node.h:13:2
  10
  11 public:
  12     Node();
-> 13     Node(const T& new_entry);
  14     Node(const T& new_entry, Node<T>* new_next_node);
  15     T getEntry() const;
  16     void setEntry(const T& new_entry);
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002d08 Lab05`Node<std::__1::basic_string<char, std::char_traits<char>, std::allocator<char> > >::__1::Node<this=0x000000000208000, new_entry="apples"> at Node.hpp:11:10
  8
  9     template <typename T>
  10     Node<T>::Node(const T& new_entry) {
-> 11         entry = new_entry;
  12         next_node = nullptr;
  13     }
  14
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002d1a Lab05`Node<std::__1::basic_string<char, std::char_traits<char>, std::allocator<char> > >::__1::Node<this=0x000000000208000, new_entry="apples"> at Node.hpp:12:12
  9     template <typename T>
  10     Node<T>::Node(const T& new_entry) {
  11         entry = new_entry;
-> 12         next_node = nullptr;
  13     }
  14
  15     template <typename T>
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002d22 Lab05`Node<std::__1::basic_string<char, std::char_traits<char>, std::allocator<char> > >::__1::Node<this=0x000000000208000, new_entry="apples"> at Node.hpp:13:1
  10     Node<T>::Node(const T& new_entry) {
  11         entry = new_entry;
  12         next_node = nullptr;
-> 13     }
  14
  15     template <typename T>
  16     Node<T>::Node(const T& new_entry, Node<T>* new_next_node) {
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002b9d Lab05`Node<std::__1::basic_string<char, std::char_traits<char>, std::allocator<char> > >::__1::Node<this=0x000000000208000, new_entry="apples"> at Node.hpp:13:1
  10     Node<T>::Node(const T& new_entry) {
  11         entry = new_entry;
  12         next_node = nullptr;
-> 13     }
  14
  15     template <typename T>
  16     Node<T>::Node(const T& new_entry, Node<T>* new_next_node) {
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x000000010000288d Lab05`LinkedList<std::__1::basic_string<char, std::char_traits<char>, std::allocator<char> > >::__1::LinkedList<this=0x0000000000000000, position=1, new_entry="apples"> at LinkedList.hpp:50:20
  47     Node<T>* insert_ptr = nullptr;
  48     Node<T>* prev_ptr = nullptr;
  49     Node<T>* target_ptr = nullptr;
-> 50     insert_ptr = new Node<T>(new_entry);
  51     if (position == 1) {
  52         insert_ptr -> setNext(headptr);
  53         headptr = insert_ptr;
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x000000010000289a Lab05`LinkedList<std::__1::basic_string<char, std::char_traits<char>, std::allocator<char> > >::__1::LinkedList<this=0x0000000000000000, position=1, new_entry="apples"> at LinkedList.hpp:51:16
  48     Node<T>* prev_ptr = nullptr;
  49     Node<T>* target_ptr = nullptr;
  50     insert_ptr = new Node<T>(new_entry);
-> 51     if (position == 1) {
  52         insert_ptr -> setNext(headptr);
  53         headptr = insert_ptr;
  54     } else {
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x00000001000028a8 Lab05`LinkedList<std::__1::basic_string<char, std::char_traits<char>, std::allocator<char> > >::__1::LinkedList<this=0x0000000000000000, position=1, new_entry="apples"> at LinkedList.hpp:52:4
  49     Node<T>* target_ptr = nullptr;
  50     insert_ptr = new Node<T>(new_entry);
  51     if (position == 1) {
-> 52         insert_ptr -> setNext(headptr);
  53         headptr = insert_ptr;
  54     }
  55     prev_ptr = getNodeAt(position - 1);
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002bc0 Lab05`Node<std::__1::basic_string<char, std::char_traits<char>, std::allocator<char> > >::__1::Node<this=0x000000000208000, new_next_node=0x0000000000000000> at Node.hpp:28:14
  25
  26     template <typename T>
  27     void Node<T>::setNext(Node<T>* new_next_node) {
-> 28         next_node = new_next_node;
  29     }
  30
  31     template <typename T>
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002bc8 Lab05`Node<std::__1::basic_string<char, std::char_traits<char>, std::allocator<char> > >::__1::Node<this=0x000000000208000, new_next_node=0x0000000000000000> at Node.hpp:29:1
  26     template <typename T>
  27     void Node<T>::setNext(Node<T>* new_next_node) {
  28         next_node = new_next_node;
-> 29     }
  30
  31     template <typename T>
  32     T Node<T>::getEntry() const {
Target 0: (Lab05) stopped.

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(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x00000001000028b8 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=1, new_entry="apples") at LinkedList.hpp:62:10
    49 Node<T>* target_ptr = nullptr;
    50 insert_ptr = new Node<T>(new_entry);
    51 if (position == 1) {
-> 52     insert_ptr -> setNext(headptr);
    53     headptr = insert_ptr;
    54     } else {
    55         prev_ptr = getNodeAt(position - 1);
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x00000001000028b8 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=1, new_entry="apples") at LinkedList.hpp:63:14
    50 insert_ptr = new Node<T>(new_entry);
    51 if (position == 1) {
    52     insert_ptr -> setNext(headptr);
-> 53     headptr = insert_ptr;
    54     } else {
    55         prev_ptr = getNodeAt(position - 1);
    56         target_ptr = prev_ptr -> getNext();
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x00000001000028b8 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=1, new_entry="apples") at LinkedList.hpp:64:3
    51 if (position == 1) {
    52     insert_ptr -> setNext(headptr);
    53     headptr = insert_ptr;
-&> 54     } else {
    55         prev_ptr = getNodeAt(position - 1);
    56         target_ptr = prev_ptr -> getNext();
    57         insert_ptr -> setNext(target_ptr);
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x000000010000291c Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=1, new_entry="apples") at LinkedList.hpp:60:11
    57 insert_ptr -> setNext(target_ptr);
    58 prev_ptr -> setNext(insert_ptr);
    59     }
-&> 60     m_length++;
    61     } else {
    62         throw (std::runtime_error("invalid position\n"));
    63     }
Target 0: (Lab05) stopped.
(11db) frame variable *headptr
(Node<std::basic_string<char, std::char_traits<char>, std::allocator<char> > >) *headptr = {
  entry = "apples"
  next_node = nullptr
}
(11db) frame variable *headptr
(Node<std::basic_string<char, std::char_traits<char>, std::allocator<char> > >) *headptr = {
  entry = "apples"
  next_node = nullptr
}
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002925 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=1, new_entry="apples") at LinkedList.hpp:61:2
    58 prev_ptr -> setNext(insert_ptr);
    59     }
    60     m_length++;
-> 61     } else {
    62         throw (std::runtime_error("invalid position\n"));
    63     }
    64 }
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002980 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=1, new_entry="apples") at LinkedList.hpp:64:1
    61     } else {
    62         throw (std::runtime_error("invalid position\n"));
    63     }
-> 64     }
    65
    66 template <typename T>
    67 void LinkedList<T>::remove(int position) {
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x000000010000258e Lab05`Tester::run(this=0x00000003040c3890) at Tester.cpp:14:16
    11 void Tester::run() {
    12     try {
    13     try {
-> 14         groceries -> insert(1, "apples");
    15         groceries -> insert(2, "bananas");
    16         groceries -> insert(3, "sweet potatoes");
    17         groceries -> insert(4, "argula");
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x00000001000025a3 Lab05`Tester::run(this=0x00000003040c3890) at Tester.cpp:15:3
    12 void Tester::run() {
    13     try {
    14         groceries -> insert(1, "apples");
-> 15         groceries -> insert(2, "bananas");
    16         groceries -> insert(3, "sweet potatoes");
    17         groceries -> insert(4, "argula");
    18
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x000000010000281d Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=2, new_entry="bananas") at LinkedList.hpp:45:34
    42 template <typename T>
    43 void LinkedList<T>::insert(int position, const T& new_entry) {
    44
-> 45     bool valid_position = (position >= 1) && (position <= m_length + 1);
    46     if (valid_position) {
    47         Node<T>* insert_ptr = nullptr;
    48         Node<T>* prev_ptr = nullptr;
    49         Node<T>* target_ptr = nullptr;
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002847 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=2, new_entry="bananas") at LinkedList.hpp:46:6
    43 void LinkedList<T>::insert(int position, const T& new_entry) {
    44
    45     bool valid_position = (position >= 1) && (position <= m_length + 1);
-&> 46     if (valid_position) {
    47         Node<T>* insert_ptr = nullptr;
    48         Node<T>* prev_ptr = nullptr;
    49         Node<T>* target_ptr = nullptr;
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002851 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=2, new_entry="bananas") at LinkedList.hpp:47:12
    44
    45     bool valid_position = (position >= 1) && (position <= m_length + 1);
    46     if (valid_position) {
-&> 47         Node<T>* insert_ptr = nullptr;
    48         Node<T>* prev_ptr = nullptr;
    49         Node<T>* target_ptr = nullptr;

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50         insert_ptr = new Node<T>(new_entry);
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002859 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>::insert(this=0x0000600000000000, position=2, new_entry="bananas") at LinkedList.hpp:48:12
  45         bool valid_position = (position >= 1) && (position <= m_length + 1);
  46         if (valid_position) {
  47             Node<T>* insert_ptr = nullptr;
-> 48             Node<T>* prev_ptr = nullptr;
  49             Node<T>* target_ptr = nullptr;
  50             insert_ptr = new Node<T>(new_entry);
  51             if (position == 1) {
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002861 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>::insert(this=0x0000600000000000, position=2, new_entry="bananas") at LinkedList.hpp:49:12
  47         if (valid_position) {
  48             Node<T>* insert_ptr = nullptr;
  49             Node<T>* prev_ptr = nullptr;
-> 49             Node<T>* target_ptr = nullptr;
  50             insert_ptr = new Node<T>(new_entry);
  51             if (position == 1) {
  52                 insert_ptr -> setNext(headptr);
  53                 headptr = insert_ptr;
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x000000010000286e Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>::insert(this=0x0000600000000000, position=2, new_entry="bananas") at LinkedList.hpp:50:16
  47         Node<T>* insert_ptr = nullptr;
  48         Node<T>* prev_ptr = nullptr;
  49         Node<T>* target_ptr = nullptr;
-> 50         insert_ptr = new Node<T>(new_entry);
  51         if (position == 1) {
  52             insert_ptr -> setNext(headptr);
  53             headptr = insert_ptr;
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002894 Lab05`Node<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>::Node(this=0x0000600000208020, new_entry="bananas") at Node.hpp:10:35
  7     }
  8
  9     template <typename T>
-> 10     Node<T>::Node(const T& new_entry) {
  11         entry = new_entry;
  12         next_node = nullptr;
  13     }
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002c7f Lab05`Node<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>::Node(this=0x0000600000208020, new_entry="bananas") at Node.h:13:12
  10
  11     public:
  12         Node();
-> 13         Node(const T& new_entry);
  14         Node(const T& new_entry, Node<T>* new_next_node);
  15         T getEntry() const;
  16         void setEntry(const T& new_entry);
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002d08 Lab05`Node<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>::Node(this=0x0000600000208020, new_entry="bananas") at Node.hpp:11:10
  8
  9     template <typename T>
  10     Node<T>::Node(const T& new_entry) {
-> 11         entry = new_entry;
  12         next_node = nullptr;
  13     }
  14
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002d1a Lab05`Node<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>::Node(this=0x0000600000208020, new_entry="bananas") at Node.hpp:12:12
  9     template <typename T>
  10     Node<T>::Node(const T& new_entry) {
  11         entry = new_entry;
  12         next_node = nullptr;
-> 13     }
  14
  15     template <typename T>
  16     Node<T>::Node(const T& new_entry, Node<T>* new_next_node) {
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002d22 Lab05`Node<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>::Node(this=0x0000600000208020, new_entry="bananas") at Node.hpp:13:1
  10     Node<T>::Node(const T& new_entry) {
  11         entry = new_entry;
  12         next_node = nullptr;
-> 13     }
  14
  15     template <typename T>
  16     Node<T>::Node(const T& new_entry, Node<T>* new_next_node) {
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002d3d Lab05`Node<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>::Node(this=0x0000600000208020, new_entry="bananas") at Node.hpp:13:1
  10     Node<T>::Node(const T& new_entry) {
  11         entry = new_entry;
  12         next_node = nullptr;
-> 13     }
  14
  15     template <typename T>
  16     Node<T>::Node(const T& new_entry, Node<T>* new_next_node) {
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002d5d Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>::insert(this=0x0000600000000000, position=2, new_entry="bananas") at LinkedList.hpp:50:20
  47         Node<T>* insert_ptr = nullptr;
  48         Node<T>* prev_ptr = nullptr;
  49         Node<T>* target_ptr = nullptr;
-> 50         insert_ptr = new Node<T>(new_entry);
  51         if (position == 1) {
  52             insert_ptr -> setNext(headptr);
  53             headptr = insert_ptr;
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002d8e Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>::insert(this=0x0000600000000000, position=2, new_entry="bananas") at LinkedList.hpp:51:16
  48         Node<T>* prev_ptr = nullptr;
  49         Node<T>* target_ptr = nullptr;
  50         insert_ptr = new Node<T>(new_entry);
-> 51         if (position == 1) {
  52             insert_ptr -> setNext(headptr);
  53             headptr = insert_ptr;
  54         } else {
Target 0: (Lab05) stopped.
(11db) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002de2 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>::insert(this=0x0000600000000000, position=2, new_entry="bananas") at LinkedList.hpp:55:25
  52         insert_ptr -> setNext(headptr);
  53         headptr = insert_ptr;

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54         } else {
-> 55             prev_ptr = getNodeAt(position - 1);
56             target_ptr = prev_ptr -> getNext();
57             insert_ptr -> setNext(target_ptr);
58             prev_ptr -> setNext(insert_ptr);
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002b09 Lab05'LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>>::getNodeAt(this=0x0000600000000000, position=1) at LinkedList.hpp:16:34
13     template <typename T>
14     Node<T>* LinkedList<T>::getNodeAt(int position) {
15
-> 16         bool valid_position = (position >= 1) && (position <= m_length);
17         if (valid_position) {
18             Node<T>* jumper = nullptr;
19             jumper = headptr;
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002c0e Lab05'LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>>::getNodeAt(this=0x0000600000000000, position=1) at LinkedList.hpp:17:6
14     Node<T>* LinkedList<T>::getNodeAt(int position) {
15
-> 16         bool valid_position = (position >= 1) && (position <= m_length);
17         if (valid_position) {
18             Node<T>* jumper = nullptr;
19             jumper = headptr;
20             for (int i = 1; i < position; i++) {
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002c1c Lab05'LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>>::getNodeAt(this=0x0000600000000000, position=1) at LinkedList.hpp:18:12
15
-> 16         bool valid_position = (position >= 1) && (position <= m_length);
17         if (valid_position) {
18             Node<T>* jumper = nullptr;
19             jumper = headptr;
20             for (int i = 1; i < position; i++) {
21                 jumper = jumper -> getNext();
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002c24 Lab05'LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>>::getNodeAt(this=0x0000600000000000, position=1) at LinkedList.hpp:19:12
16     bool valid_position = (position >= 1) && (position <= m_length);
17     if (valid_position) {
18         Node<T>* jumper = nullptr;
-> 19         jumper = headptr;
20         for (int i = 1; i < position; i++) {
21             jumper = jumper -> getNext();
22         }
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002c2b Lab05'LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>>::getNodeAt(this=0x0000600000000000, position=1) at LinkedList.hpp:20:12
17     if (valid_position) {
18         Node<T>* jumper = nullptr;
19         jumper = headptr;
-> 20         for (int i = 1; i < position; i++) {
21             jumper = jumper -> getNext();
22         }
23     return (jumper);
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002c59 Lab05'LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>>::getNodeAt(this=0x0000600000000000, position=1) at LinkedList.hpp:23:11
20     for (int i = 1; i < position; i++) {
21         jumper = jumper -> getNext();
22     }
-> 23     return (jumper);
24 }
25     throw (std::runtime_error("invalid position"));
26 }
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002b0e Lab05'LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>>::insert(this=0x0000600000000000, position=2, new_entry="bananas") at LinkedList.hpp:55:13
52     insert_ptr -> setNext(headptr);
53     headptr = insert_ptr;
54 } else {
-> 55     prev_ptr = getNodeAt(position - 1);
56     target_ptr = prev_ptr -> getNext();
57     insert_ptr -> setNext(target_ptr);
58     prev_ptr -> setNext(insert_ptr);
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002b0e Lab05'LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>>::insert(this=0x0000600000000000, position=2, new_entry="bananas") at LinkedList.hpp:56:17
53     headptr = insert_ptr;
54 } else {
-> 55     prev_ptr = getNodeAt(position - 1);
56     target_ptr = prev_ptr -> getNext();
57     insert_ptr -> setNext(target_ptr);
58     prev_ptr -> setNext(insert_ptr);
59 }
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002b0e Lab05'LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>>::insert(this=0x0000600000000000, position=2, new_entry="bananas") at LinkedList.hpp:57:4
54 } else {
55     prev_ptr = getNodeAt(position - 1);
56     target_ptr = prev_ptr -> getNext();
-> 57     insert_ptr -> setNext(target_ptr);
58     prev_ptr -> setNext(insert_ptr);
59 }
60     m_length++;
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002b0c Lab05'Node<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>>>>::setNext(this=0x0000600000200020, new_next_node=0x0000000000000000) at Node.hpp:28:14

```

```

25
26 template <typename T>
27 void Node<T>::setNext(Node<T>* new_next_node) {
-> 28     next_node = new_next_node;
29 }
30
31 template <typename T>
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002bc8 Lab05`Node<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>> > >::setNext(this=0x0000600000208020, new_next_node=0x0000600000000000) at Node.hpp:29:11
26 template <typename T>
27 void Node<T>::setNext(Node<T>* new_next_node) {
28     next_node = new_next_node;
-> 29 }
30
31 template <typename T>
32 T Node<T>::getEntry() const {
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002990 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>> > >::insert(this=0x0000600000000000, position=2, new_entry="bananas") at LinkedList.hpp:58:4
55 prev_ptr = getNodeAt(position - 1);
56 target_ptr = prev_ptr -> getNext();
57 insert_ptr -> setNext(target_ptr);
-> 58 prev_ptr -> setNext(insert_ptr);
59 }
60 m_length++;
61 } else {
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002bc0 Lab05`Node<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>> > >::setNext(this=0x0000600000208000, new_next_node=0x0000600000208020) at Node.hpp:28:14
25
26 template <typename T>
27 void Node<T>::setNext(Node<T>* new_next_node) {
-> 28     next_node = new_next_node;
29 }
30
31 template <typename T>
32 T Node<T>::getEntry() const {
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x000000010000291c Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>> > >::insert(this=0x0000600000208000, new_next_node=0x0000600000208020) at Node.hpp:29:11
26 template <typename T>
27 void Node<T>::setNext(Node<T>* new_next_node) {
28     next_node = new_next_node;
-> 29 }
30
31 template <typename T>
32 T Node<T>::getEntry() const {
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x000000010000291c Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>> > >::insert(this=0x0000600000000000, position=2, new_entry="bananas") at LinkedList.hpp:60:11
57 insert_ptr -> setNext(target_ptr);
58 prev_ptr -> setNext(insert_ptr);
59 }
-> 60 m_length++;
61 } else {
62     throw (std::runtime_error("invalid position\n"));
63 }
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002925 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>> > >::insert(this=0x0000600000000000, position=2, new_entry="bananas") at LinkedList.hpp:61:2
58 prev_ptr -> setNext(insert_ptr);
59 }
60 m_length++;
-> 61 } else {
62     throw (std::runtime_error("invalid position\n"));
63 }
64 }
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x0000000100002990 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>> > >::insert(this=0x0000600000000000, position=2, new_entry="bananas") at LinkedList.hpp:64:1
61 } else {
62     throw (std::runtime_error("invalid position\n"));
-> 63 }
64 }
65
66 template <typename T>
67 void LinkedList<T>::remove(int position) {
Target 0: (Lab05) stopped.
(lldb) thread step-in
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x00000001000025d7 Lab05`Tester::run(this=0x00000003040c3890) at Tester.cpp:15:16
12 void Tester::run() {
13     try {
14         groceries -> insert(1, "apples");
-> 15         groceries -> insert(2, "bananas");
16         groceries -> insert(3, "sweet potatoes");
17         groceries -> insert(4, "argula");
18
19         groceries -> setEntry(2, "chickpeas");
Target 0: (Lab05) stopped.
(lldb) frame variable *groceries->headptr
(Node<std::basic_string<char, std::char_traits<char>, std::allocator<char>> > >)*groceries->headptr = {
  entry = "apples"
  next_node = 0x0000600000208020
}
(lldb) frame variable *groceries->headptr->next_node
(Node<std::basic_string<char, std::char_traits<char>, std::allocator<char>> > >)*groceries->headptr->next_node = {
  entry = "bananas"
  next_node = nullptr
}
(lldb) step
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x00000001000025ec Lab05`Tester::run(this=0x00000003040c3890) at Tester.cpp:16:3
13     try {
14         groceries -> insert(1, "apples");
15         groceries -> insert(2, "bananas");
-> 16         groceries -> insert(3, "sweet potatoes");
17         groceries -> insert(4, "argula");
18
19         groceries -> setEntry(2, "chickpeas");
Target 0: (Lab05) stopped.
(lldb) step
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x000000010000281d Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char>> > >::insert(this=0x0000600000000000, position=3, new_entry="sweet potatoes") at LinkedList.hpp:45:
34
42 template <typename T>
43 void LinkedList<T>::insert(int position, const T& new_entry) {
44
-> 45     bool valid_position = (position >= 1) && (position <= m_length + 1);
46     if (valid_position) {
47         Node<T>* insert_ptr = nullptr;
48         Node<T>* prev_ptr = nullptr;
Target 0: (Lab05) stopped.
(lldb) step

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Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x000000100002847 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=3, new_entry="sweet potatoes") at LinkedList.hpp:46:
6
43 void LinkedList<T>::insert(int position, const T& new_entry) {
44
45     bool valid_position = (position >= 1) && (position <= m_length + 1);
-> 46     if (valid_position) {
47         Node<T>* insert_ptr = nullptr;
48         Node<T>* prev_ptr = nullptr;
49         Node<T>* target_ptr = nullptr;
Target 0: (Lab05) stopped.
(lldb) step
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x000000100002851 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=3, new_entry="sweet potatoes") at LinkedList.hpp:47:
12
44
45     bool valid_position = (position >= 1) && (position <= m_length + 1);
46     if (valid_position) {
-> 47         Node<T>* insert_ptr = nullptr;
48         Node<T>* prev_ptr = nullptr;
49         Node<T>* target_ptr = nullptr;
50         insert_ptr = new Node<T>(new_entry);
51     }
Target 0: (Lab05) stopped.
(lldb) step
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x000000100002859 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=3, new_entry="sweet potatoes") at LinkedList.hpp:48:
12
45     bool valid_position = (position >= 1) && (position <= m_length + 1);
46     if (valid_position) {
47         Node<T>* insert_ptr = nullptr;
-> 48         Node<T>* prev_ptr = nullptr;
49         Node<T>* target_ptr = nullptr;
50         insert_ptr = new Node<T>(new_entry);
51         if (position == 1) {
52             if (position == 1) {
Target 0: (Lab05) stopped.
(lldb) step
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x000000100002861 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=3, new_entry="sweet potatoes") at LinkedList.hpp:49:
12
46     if (valid_position) {
47         Node<T>* insert_ptr = nullptr;
48         Node<T>* prev_ptr = nullptr;
-> 49         Node<T>* target_ptr = nullptr;
50         insert_ptr = new Node<T>(new_entry);
51         if (position == 1) {
52             insert_ptr -> setNext(headptr);
53         }
Target 0: (Lab05) stopped.
(lldb) step
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x000000100002866 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=3, new_entry="sweet potatoes") at LinkedList.hpp:50:
16
47         Node<T>* insert_ptr = nullptr;
48         Node<T>* prev_ptr = nullptr;
49         Node<T>* target_ptr = nullptr;
-> 50         insert_ptr = new Node<T>(new_entry);
51         if (position == 1) {
52             insert_ptr -> setNext(headptr);
53             headptr = insert_ptr;
Target 0: (Lab05) stopped.
(lldb) step
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step in
  frame #0: 0x000000100002b94 Lab05`Node<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::Node(this=0x0000600000000000, new_entry="sweet potatoes") at Node.hpp:10:35
7
8
9     template <typename T>
-> 10 Node<T>::Node(const T& new_entry) {
11     entry = new_entry;
12     next_node = nullptr;
13 }
Target 0: (Lab05) stopped.
(lldb) next
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step over
  frame #0: 0x000000100002b9d Lab05`Node<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::Node(this=0x0000600000000000, new_entry="sweet potatoes") at Node.hpp:13:1
10 Node<T>::Node(const T& new_entry) {
11     entry = new_entry;
12     next_node = nullptr;
-> 13 }
14
15     template <typename T>
16 Node<T>::Node(const T& new_entry, Node<T>* new_next_node) {
Target 0: (Lab05) stopped.
(lldb) next
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step over
  frame #0: 0x00000010000288d Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=3, new_entry="sweet potatoes") at LinkedList.hpp:50:
20
47         Node<T>* insert_ptr = nullptr;
48         Node<T>* prev_ptr = nullptr;
49         Node<T>* target_ptr = nullptr;
-> 50         insert_ptr = new Node<T>(new_entry);
51         if (position == 1) {
52             insert_ptr -> setNext(headptr);
53             headptr = insert_ptr;
Target 0: (Lab05) stopped.
(lldb) next
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step over
  frame #0: 0x000000100002894 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=3, new_entry="sweet potatoes") at LinkedList.hpp:51:
16
48         Node<T>* prev_ptr = nullptr;
49         Node<T>* target_ptr = nullptr;
50         insert_ptr = new Node<T>(new_entry);
-> 51         if (position == 1) {
52             insert_ptr -> setNext(headptr);
53             headptr = insert_ptr;
54         } else {
Target 0: (Lab05) stopped.
(lldb) next
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step over
  frame #0: 0x0000001000028a7 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=3, new_entry="sweet potatoes") at LinkedList.hpp:55:
25
52         insert_ptr -> setNext(headptr);
53         headptr = insert_ptr;
54     } else {
-> 55         prev_ptr = getNodeAt(position - 1);
56         target_ptr = prev_ptr -> getNext();
57         insert_ptr -> setNext(target_ptr);
58         prev_ptr -> setNext(insert_ptr);
Target 0: (Lab05) stopped.
(lldb) next
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step over
  frame #0: 0x0000001000028f1 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=3, new_entry="sweet potatoes") at LinkedList.hpp:56:
17
53         headptr = insert_ptr;
54     } else {
55         prev_ptr = getNodeAt(position - 1);
-> 56         target_ptr = prev_ptr -> getNext();
57         insert_ptr -> setNext(target_ptr);
58         prev_ptr -> setNext(insert_ptr);
59     }
Target 0: (Lab05) stopped.

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(lldb) next
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step over
  frame #0: 0x00000001000028fe Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=3, new_entry="sweet potatoes") at LinkedList.hpp:57:
4
54         } else {
55             prev_ptr = getNodeAt(position - 1);
56             target_ptr = prev_ptr -> getNext();
-> 57             insert_ptr -> setNext(target_ptr);
58             prev_ptr -> setNext(insert_ptr);
59         }
60         m_length++;
Target 0: (Lab05) stopped.
(lldb) next
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step over
  frame #0: 0x000000010000290b Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=3, new_entry="sweet potatoes") at LinkedList.hpp:58:
4
55             prev_ptr = getNodeAt(position - 1);
56             target_ptr = prev_ptr -> getNext();
57             insert_ptr -> setNext(target_ptr);
-> 58             prev_ptr -> setNext(insert_ptr);
59         }
60         m_length++;
61     } else {
Target 0: (Lab05) stopped.
(lldb) next
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step over
  frame #0: 0x0000000100002925 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=3, new_entry="sweet potatoes") at LinkedList.hpp:60:
11
57             insert_ptr -> setNext(target_ptr);
58             prev_ptr -> setNext(insert_ptr);
59         }
-> 60         m_length++;
61     } else {
62         throw (std::runtime_error("invalid position\n"));
63     }
Target 0: (Lab05) stopped.
(lldb) next
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step over
  frame #0: 0x0000000100002930 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=3, new_entry="sweet potatoes") at LinkedList.hpp:61:
2
58             prev_ptr -> setNext(insert_ptr);
59         }
60         m_length++;
-> 61     } else {
62         throw (std::runtime_error("invalid position\n"));
63     }
64 }
Target 0: (Lab05) stopped.
(lldb) next
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step over
  frame #0: 0x0000000100002930 Lab05`LinkedList<std::__1::basic_string<char, std::__1::char_traits<char>, std::__1::allocator<char> > >::insert(this=0x0000600000000000, position=3, new_entry="sweet potatoes") at LinkedList.hpp:64:
1
61         } else {
62             throw (std::runtime_error("invalid position\n"));
63         }
-> 64     }
65
66     template <typename T>
67     void LinkedList<T>::remove(int position) {
Target 0: (Lab05) stopped.
(lldb) next
Process 10090 stopped
* thread #1, queue = 'com.apple.main-thread', stop reason = step over
  frame #0: 0x0000000100002620 Lab05`Tester::run(this=0x00000003040c3890) at Tester.cpp:16:16
13         try {
14             groceries -> insert(1, "apples");
15             groceries -> insert(2, "bananas");
-> 16             groceries -> insert(3, "sweet potatoes");
17             groceries -> insert(4, "argula");
18
19             groceries -> setEntry(2, "chickpeas");
Target 0: (Lab05) stopped.
(lldb) frame variable *groceries->headptr
(Node<std::basic_string<char, std::char_traits<char>, std::allocator<char> > >)*groceries->headptr = {
  entry = "apples"
  next_node = 0x000060000208020
}
(lldb) frame variable *groceries->headptr->next_node
(Node<std::basic_string<char, std::char_traits<char>, std::allocator<char> > >)*groceries->headptr->next_node = {
  entry = "bananas"
  next_node = 0x00006000020c000
}
(lldb) frame variable *groceries->headptr->next_node->next_node
(Node<std::basic_string<char, std::char_traits<char>, std::allocator<char> > >)*groceries->headptr->next_node->next_node = {
  entry = "sweet potatoes"
  next_node = nullptr
}
(lldb)

```