
Subject: Trouble with pointers.

Posted by [snap2000](#) on Sat, 25 Aug 2007 03:04:41 GMT

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I was trying to make a LinkedList class and it seemed to be going pretty well, but I've run into an annoying stumbling block:

In file included from C:\Apps\Classes\LinkedList\main.cpp:4:

C:/Apps/Classes/LinkedList/LinkedList.cpp: In member function `LinkedList::Node&

LinkedList::Push()':

C:/Apps/Classes/LinkedList/LinkedList.cpp:56: error: invalid initialization of reference of type 'LinkedList::Node&' from expression of type 'LinkedList::Node*'

LinkedList.cpp

C:\Apps\Classes\LinkedList\LinkedList.cpp: In member function `LinkedList::Node&

LinkedList::Push()':

C:\Apps\Classes\LinkedList\LinkedList.cpp:56: error: invalid initialization of reference of type 'LinkedList::Node&' from expression of type 'LinkedList::Node*'

Here is the code that I have:

LinkedList.h

```
#ifndef _LinkedList_LinkedList_h_
```

```
#define _LinkedList_LinkedList_h_
```

```
class LinkedList {
```

```
public:
```

```
    struct Node {
```

```
        int uid; // Node identifier
```

```
        Node *prev; // Pointer to the previous node
```

```
        Node *next; // Pointer to next node
```

```
    };
```

```
private:
```

```
    Node *first; // Pointer to first item
```

```
    Node *last; // Pointer to last item
```

```
    Node *current; // Pointer to current item (iterator)
```

```
    int count; // Number of items in list
```

```
    int uid; // Unique identifier for nodes
```

```
public:
```

```
    typedef LinkedList CLASSNAME;
```

```
    LinkedList(); // Constructor
```

```
    ~LinkedList(); // Deconstructor
```

```
    Node& First() { return *first; }; // Returns first item
```

```
    Node& Last() { return *last; }; // Returns last item
```

```
    Node& Current() { return *current; }; // Returns current item (iterator)
```

```
    int Count() { return count; }; // Returns item count
```

```
Node& Iterate(); // Returns each item in the list successively
void Reset(); // Resets iterator to first item
```

```
Node& Push(); // Adds item to back of list
Node& UnShift(); // Adds item to front of list
Node& Pop(); // Removes item from back of list
Node& Shift(); // Removes item from front of list
```

```
void Remove();
};
```

```
#endif
```

```
LinkedList.cpp:
#include <iostream>
```

```
#include "LinkedList.h"
```

```
LinkedList::LinkedList() {
    first = NULL;
    last = NULL;
    count = 0;
    uid = 0;
}
```

```
LinkedList::~LinkedList() {
    Node *temp;
    /*
    while( ( temp = Iterate() ) != NULL ) {
        delete temp;
    }
    */
}
```

```
LinkedList::Node& LinkedList::Iterate() {
    /*
    Node *temp = current;
    if( current != NULL )
        current = current->next;
    else
        Reset();
    return *temp;
    */
}
```

```

void LinkedList::Reset() {
    current = first;
}

LinkedList::Node& LinkedList::Push() {
    Node *temp;

    // Set new node attributes
    temp = new Node;
    temp->uid = ++uid;
    temp->prev = last;
    temp->next = NULL;

    if( last != NULL )
        last->next = temp; // Link previous item to new node

    last = temp;
    if( !count ) // If list is empty, new node is also first
        first = temp;

    count++;

    return temp;
}

LinkedList::Node& LinkedList::UnShift() {

    count++;
}

LinkedList::Node& LinkedList::Shift() {
    count--;
}

LinkedList::Node& LinkedList::Pop() {
    count--;
}

void LinkedList::Remove() {
    count--;
}

```

The error only goes away when I return *temp instead of just temp. However, if I do this and uncomment the contents of the destructor, I get the following error instead:

In file included from C:\Apps\Classes\LinkedList\main.cpp:4:
C:/Apps/Classes/LinkedList/LinkedList.cpp: In destructor `LinkedList::~~LinkedList()':

```
C:/Apps/Classes/LinkedList/LinkedList.cpp:15: error: cannot convert `LinkedList::Node' to
`LinkedList::Node*' in assignment
LinkedList.cpp
C:/Apps/Classes/LinkedList/LinkedList.cpp: In destructor `LinkedList::~~LinkedList()':
C:/Apps/Classes/LinkedList/LinkedList.cpp:15: error: cannot convert `LinkedList::Node' to
`LinkedList::Node*' in assignment
LinkedList: 2 file(s) built in (0:00.79), 398 msec / file, duration = 828 msec
```

I thought I understood pointers pretty well, but I just don't know what's going on. Help please?

Subject: Re: Trouble with pointers.
Posted by [mirek](#) on Sat, 25 Aug 2007 06:38:25 GMT
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Reference and pointer is not the same thing.

"temp" is pointer, but you are trying to return the reference there.

You have to use "*" to convert a pointer to a l-value, which is then convertible to reference. You have to use "&" to convert l-value or reference to a pointer.

Mirek

Subject: Re: Trouble with pointers.
Posted by [snap2000](#) on Sat, 25 Aug 2007 07:09:17 GMT
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Yeah, it'd been too long. I read up on references and pointers a bit and got it working, thanks.
