Array out of Bounds

Normally bounds are unchecked for execution efficiency
int all[] = {5, 6, 7, 8, 9, 10, 11, 12, 13, 14};
string names[] = {"dasher", "dancer", "prancer", "vixon", "comet", "cupid",
    "donner", "bliltzen", "rudolph", "Joseph"};
all[10] = 47;
    // Error doesn't show up until after it completes running normally
    // Error: Run-Time Failure Check #2, stack around the variable "all" was corrupted
Debug Error!

Program: ...\allan\Class\cs2420\Projects\Debugging\Debug\Debugging.exe
Module: ...\allan\Class\cs2420\Projects\Debugging\Debug\Debugging.exe
File:

Run-Time Check Failure #2 - Stack around the variable 'all' was corrupted.

(Press Retry to debug the application)
Shallow and Deep Copy

• When you pass in an object into a method (rather than a pointer to the object), a copy is created.

• When you exit the method, the destructor is used to delete the object.

• The problem is the combination of a shallow copy on entering the method and a deep destroy.
class OListNode
{
    public:
        OListNode(Object &theElement, string aname, OListNode * n = NULL )
            : element( theElement ), next( n ) {
            name = new string();
            *name = aname;
            cout << "Constructing the node at " << toString() << endl;
        }

        ~OListNode() {
            cout << "destroying the node at " << toString() << endl;
            delete name;
        }

        string toString() {
            return *name;
        }

    Object & element;
    string *name;
    OListNode *next;
};
void changeCopy(OLListNode<int> o)
{
  *(o.name) = "SuperMan";
  cout << "Changed Node " << o.toString() << endl;
}

int x = 100;
OLListNode<int> * o = new OListNode<int>(x, "Clark Kent");
cout << "Original Node " << o->toString() << endl;
changeCopy(*o);
cout << "Original Node (again)" << o->toString() << endl;
Original Object
(dynamically allocated string)
Shallow Copy

Deep Destroy
Debug Error!

Program: ...\allanv\Class\cs2420\Projects\Debugging\Debug\Debugging.exe

This application has requested the Runtime to terminate it in an unusual way. Please contact the application's support team for more information.

(Press Retry to debug the application)
Constructing the node at Clark Kent
Original Node Clark Kent
Changed Node Superman
destroying the node at Superman

This application has requested the Runtime to terminate it in an unusual way. Please contact the application’s support team for more information.
Press any key to continue . . . .
Mystery Error
After running, all nodes with zero predct have length of 0, all others have 1. WHY?

```cpp
void Graph::longLength()
{
    queue<GraphNode> nodeList = topsort();

    while (!nodeList.empty())
    {
        GraphNode curr = nodeList.front();
        nodeList.pop();
        for( EdgeNode * e = curr.adj; e != NULL; e = e->next)
        {
            if( curr.length + 1 > G[e->Tail].length)
                G[e->tail].length = curr.length + 1;
        }
    }
}
```