Zach Forster

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**Huffman Coding Assignment**

Despite some struggles throughout this assignment, we were finally able to get it fully functioning. Our only unresolved issue was that we had some memory leaks that continue to elude us. We did deviate from the provided main, but only with regard to the return type of the first function. We needed it to return a linked list rather than a pointer to tNodes.

When creating the histogram and tree functions, we had very few issues at all. The few problems we did run across were usually “off by one” errors. In our tree function, we added all of the new node values we created back into the list. This ended up creating a whole slew of extra links that were not necessary. To combat this, we went through and assigned all the weights of these values to -1. We then removed every link in our list with a node weight of -1, effectively clearing up the linked list.

Creating the last two functions was by far the most difficult challenge we faced while coding this assignment. We had a lingering “off by one” error in our decode function that was changing spaces to a’s, and we must have spent hours attempting to fix it. When writing the encode function, the problem of arranging the bits in the correct order before shipping them out to the file proved to be the most arduous task. What we ended up doing was traversing the tree from the bottom up, recording our ones and zeroes, and then reversing those ones and zeroes, so as to avoid printing out the file backwards.

As mentioned before, the only holes persisting within our code were a few memory leaks that we could not pin down. Specifically, there were 47 blocks of memory that were allocated in the llAddAtIndex function, and one in the llAdd function. Debugging information from valgrind led us to believe that all of those in the llAddAtIndex function occurred in the case that index was equal to zero, but since we still could not free them, this may have just been a coincidence.

Overall, the assignment was extremely beneficial to both of us, providing us with valuable debugging experience, experience using a command-line text editor, and most of all, a challenge. We may not have been able to free everything, but we are quite happy with the progress that we did make, and look forward to the next challenge.