Aleesha Nageer
anageer@ucsc.edu
11/30/2020

CSE 13S Fall 2020
Assignment 6: Down the Rabbit Hole and Through the Looking Glass:
Bloom Filters, Hashing, and the Red Queen's Decrees
Writeup Document

Initially reading through this assignment was extremely intimidating and I had no clue of where to even begin. Wrapping my head around bloom filters, hash tables, and linked lists took some time considering I hadn't coded in C much prior to this class and I'm used to the built-in dictionary functions in Python. However, after attending lab section, I understood the goal overall.

In this assignment, I struggled most with the regular expression statement and properly printing the output. I had never worked with regular expressions before so understanding how little easy-to-miss mistakes could seriously mess up reading in the user's input took a lot of time. My biggest issue was that I had a white space at the end of my regex statement. It took several emails for me to realize there was a space right before the ending quotation mark.

The other issue I had was printing my output. I struggled with this because I originally was not returning the correct node in my ll_lookup function if move_to_front was false. My pointer was off by one and would print a random oldspeak each time I printed. I also couldn't properly print the words I was saving in my ListNodes translated and nonsense because when calling ll_lookup, I was providing the node as a source rather than translated/nonsense. Maybe it was my lack of sleep, but I could not identify this error for days.

I have some memory leaks that I couldn't quite figure out, but I tried my best to free most of it. Overall, this assignment allowed me to become more comfortable with pointers, hash tables, and linked lists.

Writeup Questions

1. When increasing the size of the hash table, the average linked list length went down since there were more indices for the nodes to be stored in. With more indices, there are less collisions, hence making the number of nodes in each linked list to be lesser.
2. When varying the bloom filter size the only number that differed was the bloom filter load percentage. This makes sense since the equation for finding this percentage required division by the bloom filter size. I'm not sure if my calculations are accurate but the number of bits being set does not change when the bloom filter's size is being changed.
3. You don't absolutely need the move to front rule. However, for optimization purposes, being able to move the node to the front instead of just iterating through every node in the linked list will increase the time complexity when the program is looking for a specific key, value pair.