Assignment 3 Writeup

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Abstract

This assignment seemed to be a tad lighter in difficultly, but only because the previous assignments had essentially taught the technical aspects of the assignment. The bit vector and the bloom filter were quite simple to create while the binary search tree was a reasonable combination of challenge and previous experience. Overall this assignment is an entertaining way to understand hash mapping and a fun look into the dystopian world of the Great People's Republic of Santa Cruz.
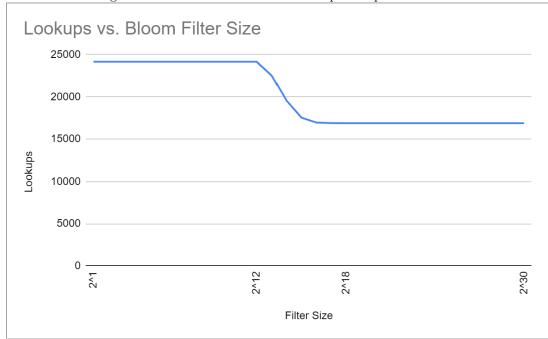
Variations

- Lookups
  While changing the size of the hashtable does not change the number of lookups, increasing the size of the bloomfilter will decrease the number of lookups, but only in a certain range of sizes. The number of lookups will only start to decrease between 2^12 and 2^18 and will stagnate before and after.

- BST Size
  While changing the size of the bloomfilter does not change the BST size, increasing the size of the Hashtable will decrease the BST size. exponentially, eventually reaching an average size of 1 (at least to the precision of 6 decimal places).

Graphs

Based off of calling banhammer with the bee movie script as input.

Lookups vs. Bloom Filter Size

Y-axis: Lookups — 0, 5000, 10000, 15000, 20000, 25000

X-axis: Filter Size — 2^1, 2^12, 2^18, 2^30

BST Size vs. Hash Table Size

Y-axis: Average BST Size — 0, 5.0E+7, 1.0E+8, 1.5E+8, 2.0E+8, 2.5E+8

X-axis: Table Size — 2^1, 2^12, 2^18, 2^30