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CS 526 Data Structures and Algorithms

Assignment 6 -
Compare the insertion and search times for three data structures in Java

- HashMap
- ArrayList
- LinkedList

The experimental code was to create an array of 100,000 random integers between the range of 1 and 1,000,000 and store them into an array.

Each data structure was empty and a key was inserted one at a time until the 100,000 random integers were inserted. The insertion time was measured for each data structure.

HashMap Insertion Average: 22 milliSeconds
Array Insertion Average: 4 milliSeconds
LinkedList Insertion Average: 6 milliSeconds

For searching, an array was created with 100,000 random integers between the range of 1 and 2,000,000

Map Search Average: 6 milliSeconds
Array Search Average: 13 Seconds
LinkedList Search Average: 35 Seconds

The searching iterations were very slow, especially collecting 10 iterations. The results were as expected, the hashmap easily outperformed both the ArrayList and LinkedList.
Note that I used the system.nanotime to collect the start and stop times in order to gain a little more granularity in my timing.