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CSCI 335
10 April 2024

	1st test	2nd test	3rd test
Vector	409 ms	221 ms	289 ms
List	1663 ms	1710 ms	1774 ms
Heap	574 ms	234 ms	233 ms
AVL Tree	238 ms	573 ms	251 ms

Vector

In the vectorMedian function, it consists of a single for loop and other functions such as the insertion operation and deletion operation. In this case, the time complexity for both insertion and deletion operation is O(n) where n is the number of values in the vector. They are O(n) operations because you need to shift the values in order to make room for the new values. Overall, the time complexity of this function is O(n^2) because you're looping through each value in instructions" and the time complexity for insertion and deletion is both O(n) so it's O(n^2)

List

The listMedian function does the same thing where it traverses the instruction's vector and that is O(n) time. The function also includes insertion and deletion. The insertion operation is O(n) time because it needs to traverse through the list to find where to insert. The deletion operation is just O(1) time because it just needs to adjust the pointers. Overall, the time complexity of the listMedian's function is O(n^2).

Heap

The heapMedian function also loops through the instruction's vector once so the runtime is O(n). The heap function also consists of both insertion and deletion which are both O(log n). Since we are dealing with heaps, we also have to rebalance it which is also O(log n) operations. To find the median, we take the root of the heaps and compare to see which one is smaller. The smaller of the two gets pushed into the vector of medians which is O(1) time. Overall, the time complexity for heapMedian is O(n log n).

AVL Tree

The treeMedian function also loops through the instruction's vector so the time complexity for that is O(n). Inside the loop, there are operations applied to the AVL tree such as insertion, deletion and finding minimum and maximum values. The time complexity for inserting and deleting is both O(log n). The runtime for finding minimum and maximum is also O(log n). The time complexity for pushing the medians into the vector that holds all the medians is O(1). The overall time complexity for treeMedian function is O(n * log n).