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CS352

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Unit 6 Assignment 2

**Show your timing data and write a paragraph on the benefits/drawbacks of using a List vs. a TreeMap**

=== Report 1: Test Data ===

computeByList() took: 732763 ns

Alabama: 5.87 mph

Alaska: 19.60 mph

computeByTree() took: 284810 ns

Alabama: 5.87 mph

Alaska: 19.60 mph

=== Report 2: File Data ===

computeByList() took: 34702458 ns

Alabama: 11.89 mph

Alaska: 27.58 mph

**(Omitted results for space)**

computeByTree() took: 19357941 ns

Alabama: 11.89 mph

Alaska: 27.58 mph

**(Omitted results for space)**

In my timing tests, computeByTree() consistently outperformed computeByList() in both small and large datasets. For the test data, computeByList() took 732,763 ns while computeByTree() completed in 284,810 ns. With the full file-based dataset, computeByList() took 34,702,458 ns compared to 19,357,941 ns for computeByTree(). The key difference is in how each structure handles lookup and update operations. The List requires a linear search to find and update each state’s entry, which becomes inefficient as the dataset grows. In contrast, the TreeMap uses a sorted key structure that allows for faster access and updates.