Program Structures and Algorithms

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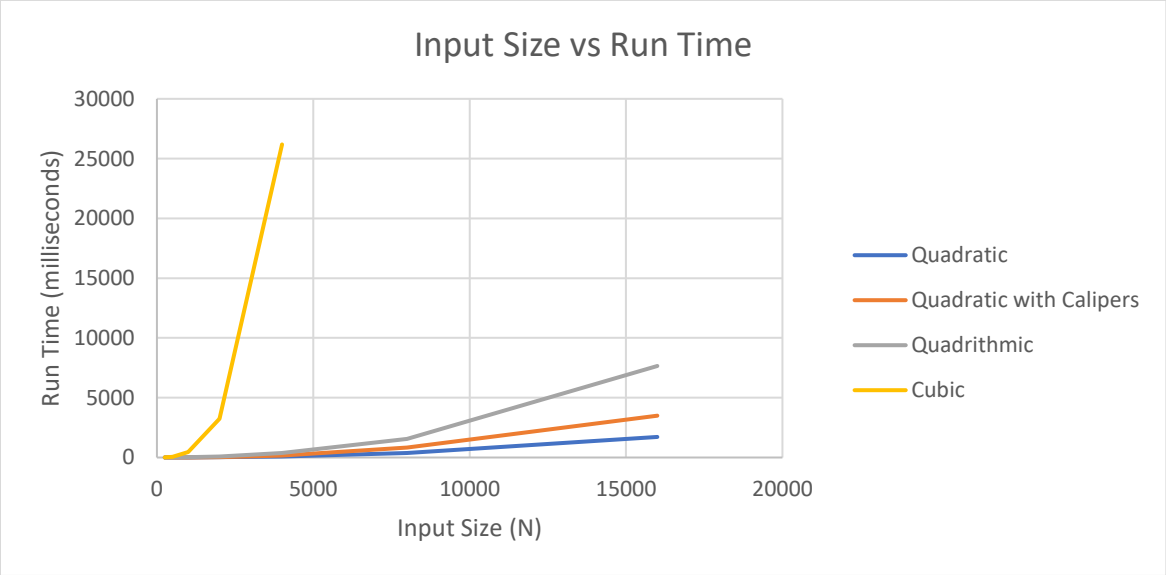
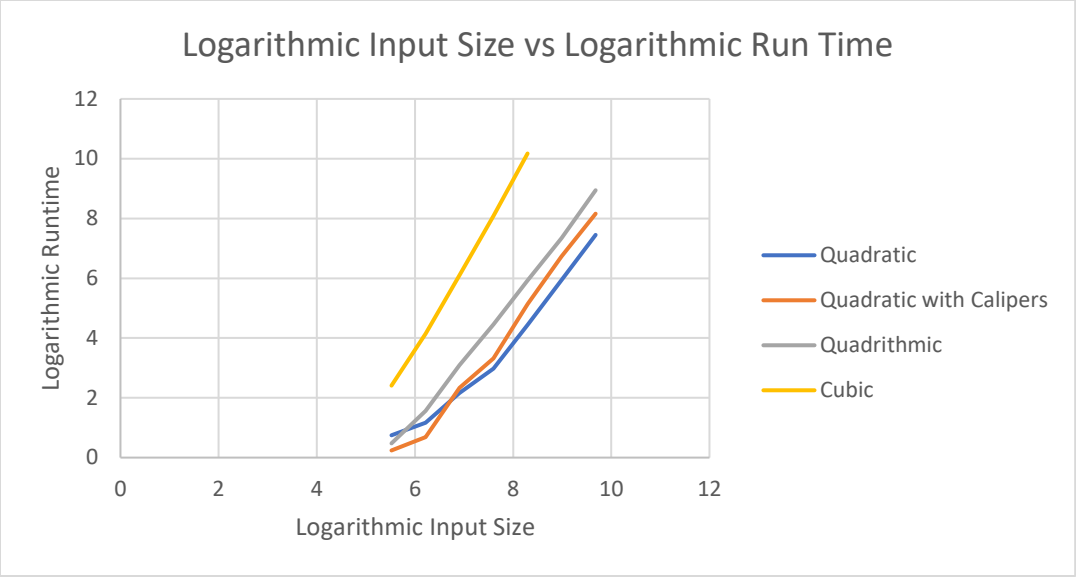
Task: 3-sum programming using the Quadrithmic, Quadratic and quadraticWithCalipers approaches.

Explanation of why the quadratic method(s) work: In 3-sum programming, the two-pointer technique outperforms binary search for triplets because it lowers the time complexity from O(n2 log n) to O(n2). The two-pointer approach employs two pointers, one starting from the array's beginning and the other from its end and pushes them toward one another dependent on the sum that is now being computed. Instead of performing a binary search for each pair in the array, which would take more time, this makes it possible to more quickly identify all the triplets whose total matches a particular target number. Furthermore, compared to the rather sophisticated binary search, the two-pointer technique is straightforward and simple to implement.

Timing observations:





Unit Test Cases: