DSA Homework 2

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Part 2

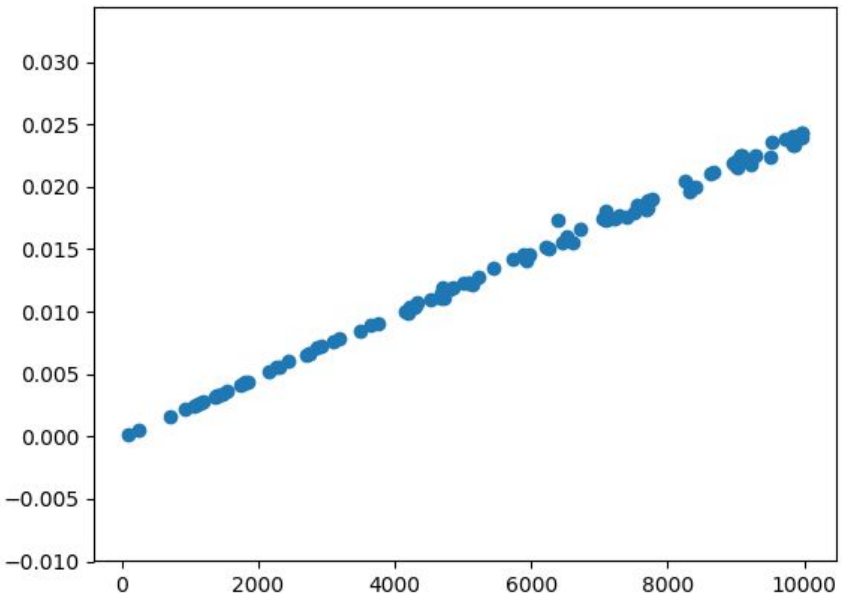

Figure 1: Number of elements vs time taken to index doubly linked list

These plots show that the time taken to index a doubly linked list is O(n), meaning that the time increases as the length of the list increases. This makes sense because the function index() of the doubly linked list contains a for loop.

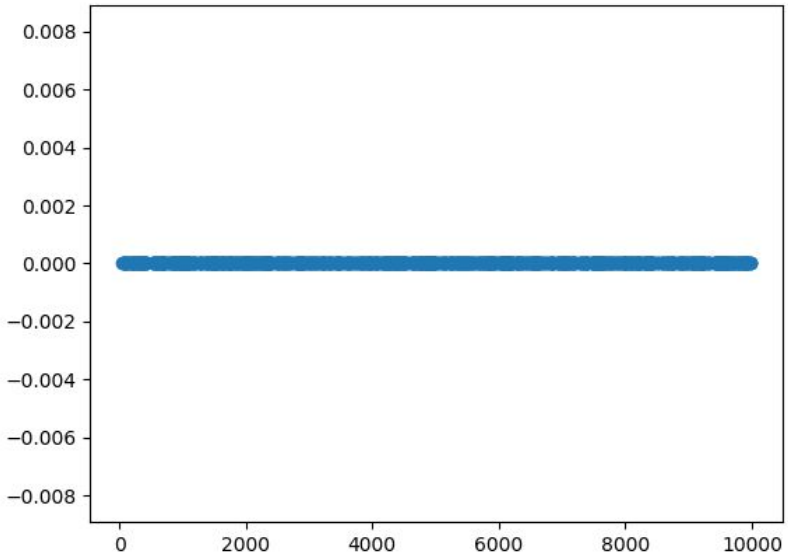

Figure 2: Number of elements vs time taken to index Python list

The time taken to index a Python list is O(1), meaning that the time stays constant even as the list increases. This implies that a Python list does not contain a for loop.

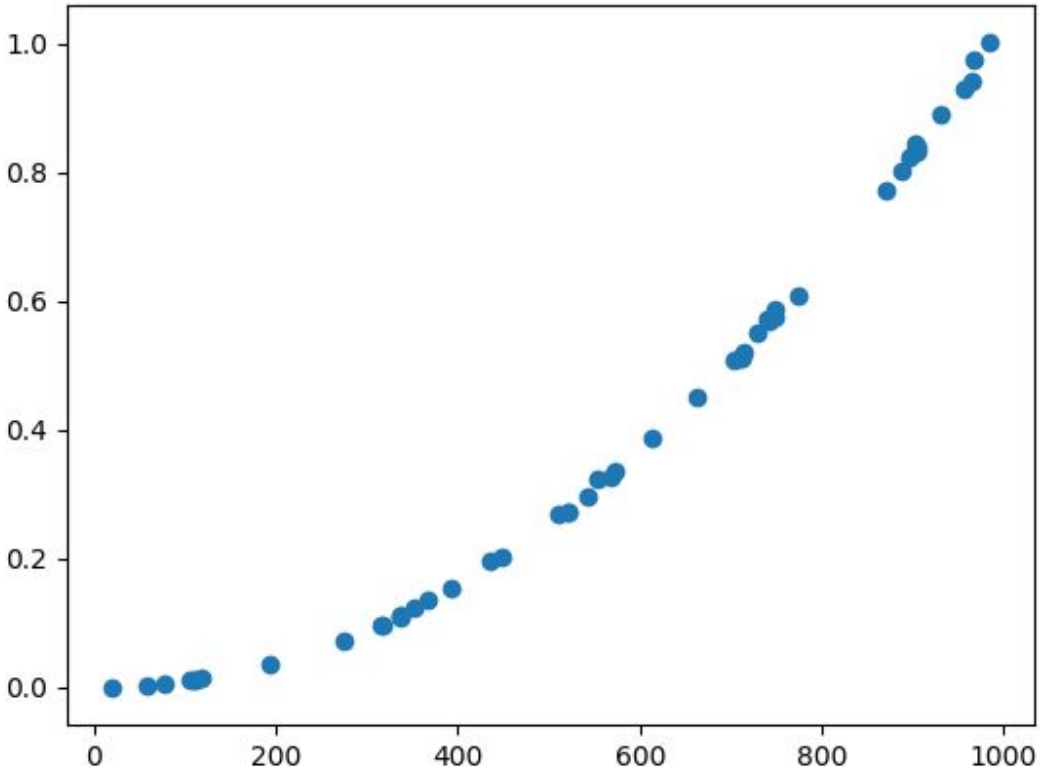

Figure 3: Number of elements vs time taken to multiply all pairs of a doubly linked list

This plot shows that the amount of time taken to do the operation multiply all pairs on a doubly linked list has a runtime of $O(n^2)$, meaning that it increases in proportion to the length of the list squared. This is because the function contains nested for loops.