**ALGORITHM ANALYST**

**Results.** The results show that there’s a large difference between each algorithm, especially the O(n^3) algorithm and the O(n) algorithm. The cubic algorithm will work, but as the data grows to > 10000, it becomes useless, as it uses too much time. The nlogn and linear algorithms work very efficiently with large data. The figure below shows the time (ms) it took for each algorithm to run when n was 100, 1000, 10000, 50000, 100000, and 500000.

As seen, the cubic algorithm scales very quickly, as the linear one stays around and less than 1 ms.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Input | O(n^3) | O(n^2) | O(nlogn) | O(n) |
| 100 | 3 ms | 1 ms | < 1 ms | < 1 ms |
| 1000 | 173 ms | 5 ms | 1 ms | < 1 ms |
| 10000 | 80431 ms | 31 ms | 2 ms | < 1 ms |
| 50000 | Na. | 740 ms | 3 ms | < 1 ms |
| 100000 | Na. | 2962 ms | 4 ms | 1 ms |
| 500000 | Na. | 76746 ms | 25 ms | 1 ms |