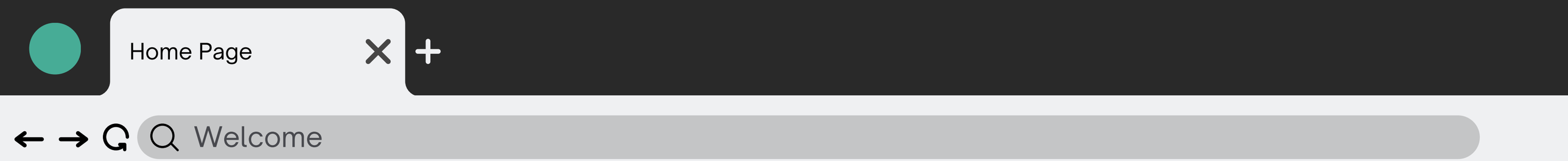


LABORATORY 5

DATA STRUCTURES ALGORITHMS

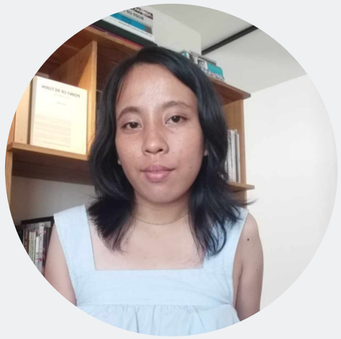
Group 6

Home Page Members

Group Members

Group 6 Members

Eugenio

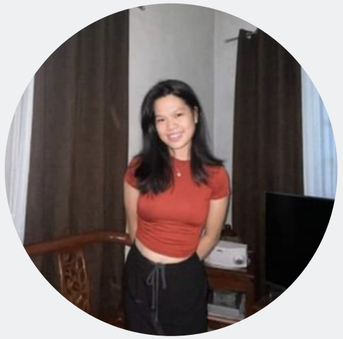


Salili

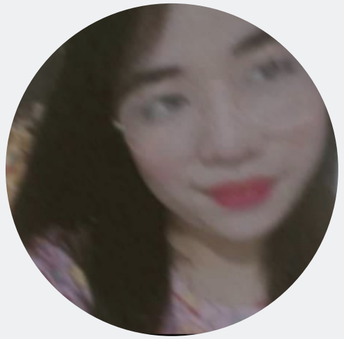
Suyat

Lumawag

Villadiego



Tadeo

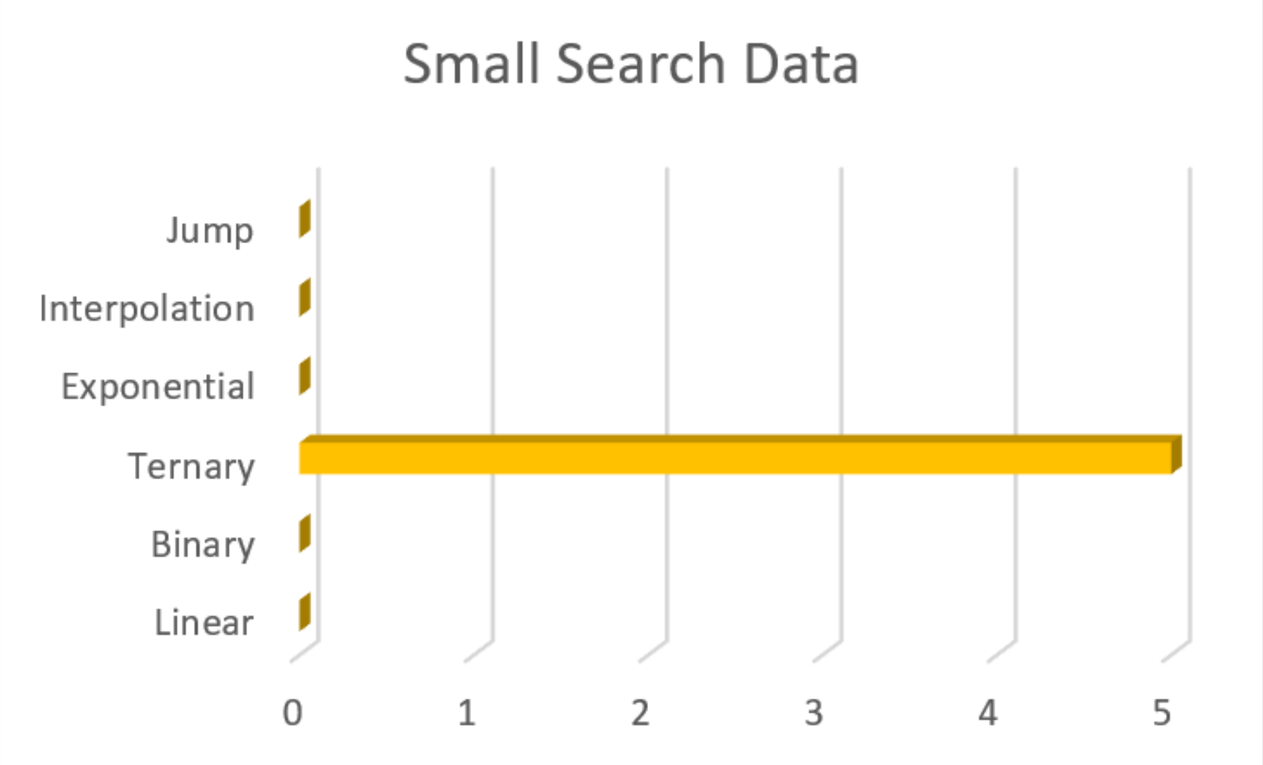


Isip

Table:

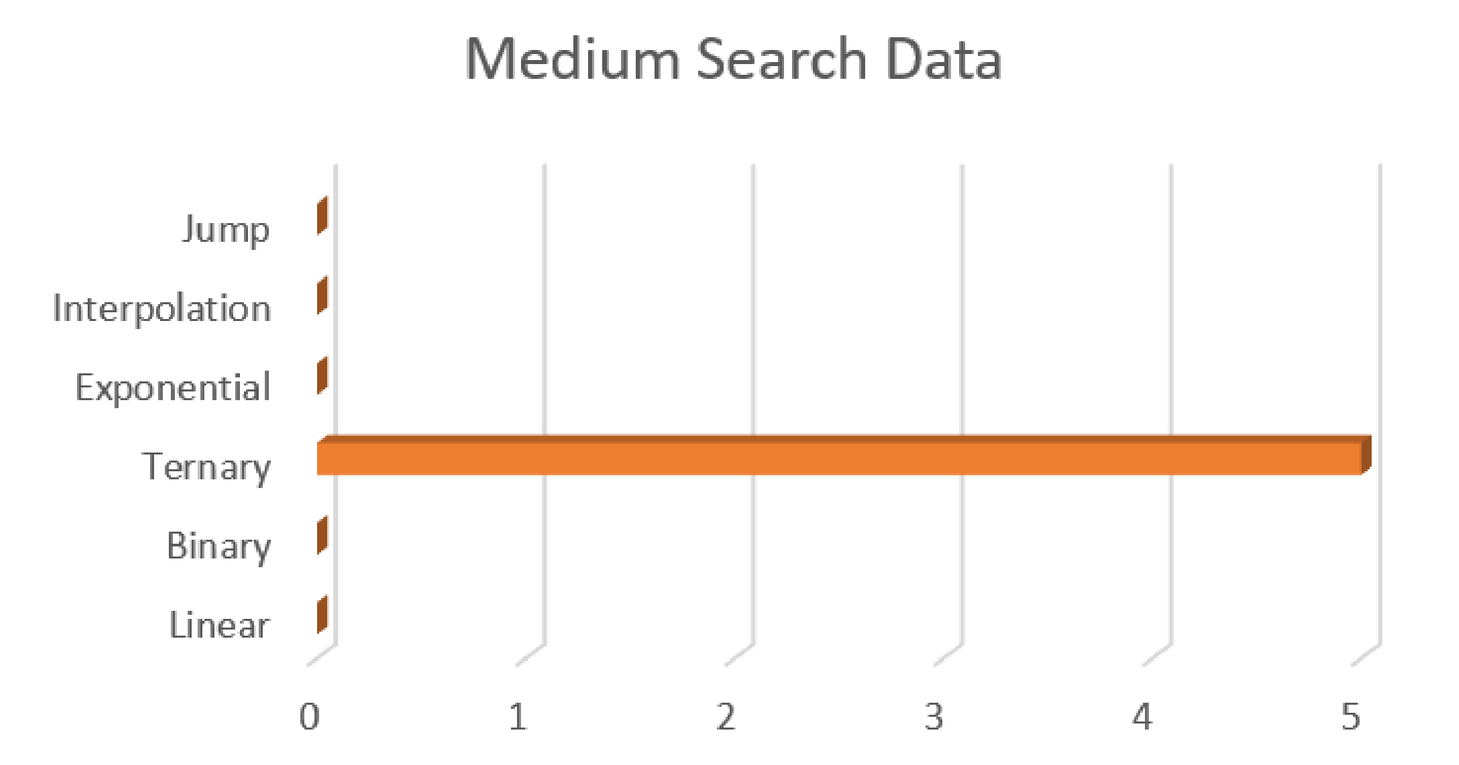
Search Algorithm Analysis Worksheet								
		Linear	Binary	Ternary	Exponential	Interpolation	Jump	
Target Set	Search Data	Time in Milliseconds						TOTAL
100	23	0.223000025	0.110999972	0.007900002	0.112999987	0.055000055	0.125000006	Ternary
	34	0.097000011	0.050000017	0.005400005	0.06000002	0.054000047	0.115000003	Ternary
	68	0.127000021	0.082000042	0.010999996	0.073000047	0.075999997	0.167000035	Ternary
	80	0.14600002	0.075999997	0.010999996	0.118000025	0.050000017	0.172	Teranry
	99	0.138999967	0.078000012	0.011600001	0.097999946	0.046000059	0.14600002	Ternary
1,000	12	0.084999992	0.052999967	0.006400005	0.136999952	0.031000018	0.135000009	Ternary
	34	0.061000028	0.071999966	0.0181	0.063999978	0.064999986	0.104999999	Ternary
	566	0.386000029	0.05599999	0.0172	0.082999977	0.051000025	0.159999981	Ternary
	899	1.021999997	0.078000012	0.007200004	0.107000014	0.053999975	0.178999981	Ternary
	987	1.160999964	0.045999986	0.0115	0.084000058	0.048000002	0.195999964	Ternary
10,000	100	0.155000016	0.099999961	0.037999998	0.151999993	0.087000008	0.149999978	Ternary
	3000	3.646999976	0.06000002	0.011900003	0.228999997	0.097000011	0.367999965	Ternary
	6000	6.35999997	0.093999988	0.029800001	0.201000003	0.045000052	0.245999981	Ternary
	7666	8.726000015	0.091000038	0.024600005	0.376000025	0.110999972	0.482999967	Ternary
	9877	6.515999994	0.041000021	0.013500001	0.332999989	0.08300005	0.54499993	Ternary

Graph: Small Data Set



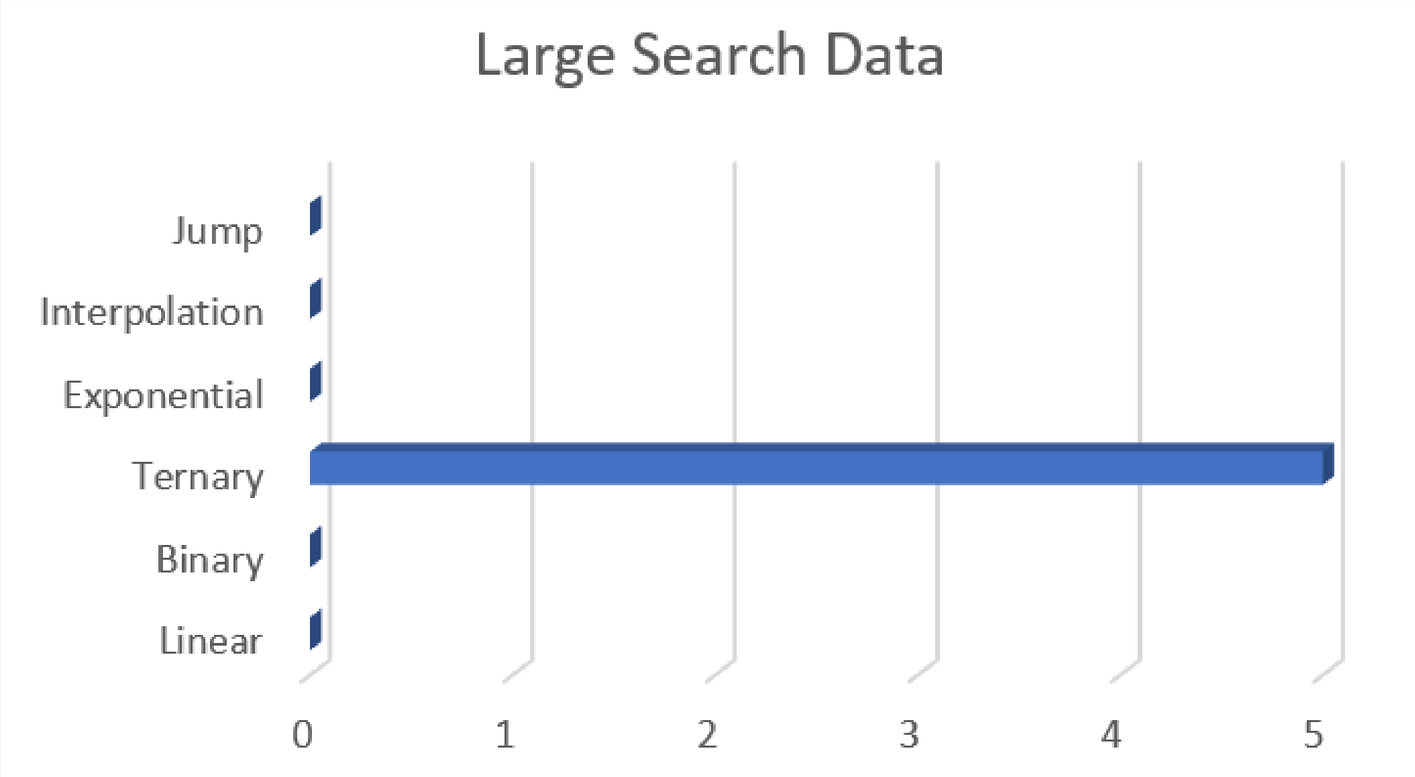
Small Data Set	
Linear	0
Binary	0
Ternary	5
Exponential	0
Interpolation	0
Jump	0

Graph: Medium Data Set



Medium Data Set	
Linear	0
Binary	0
Ternary	5
Exponential	0
Interpolation	0
Jump	0

Graph: Large Data Set

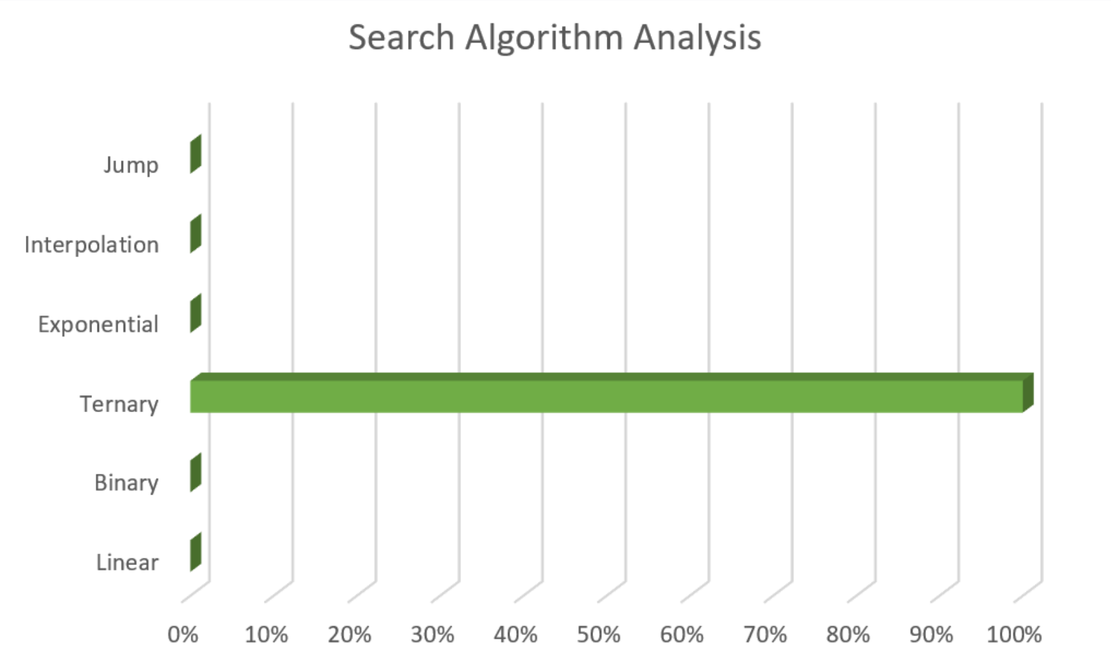


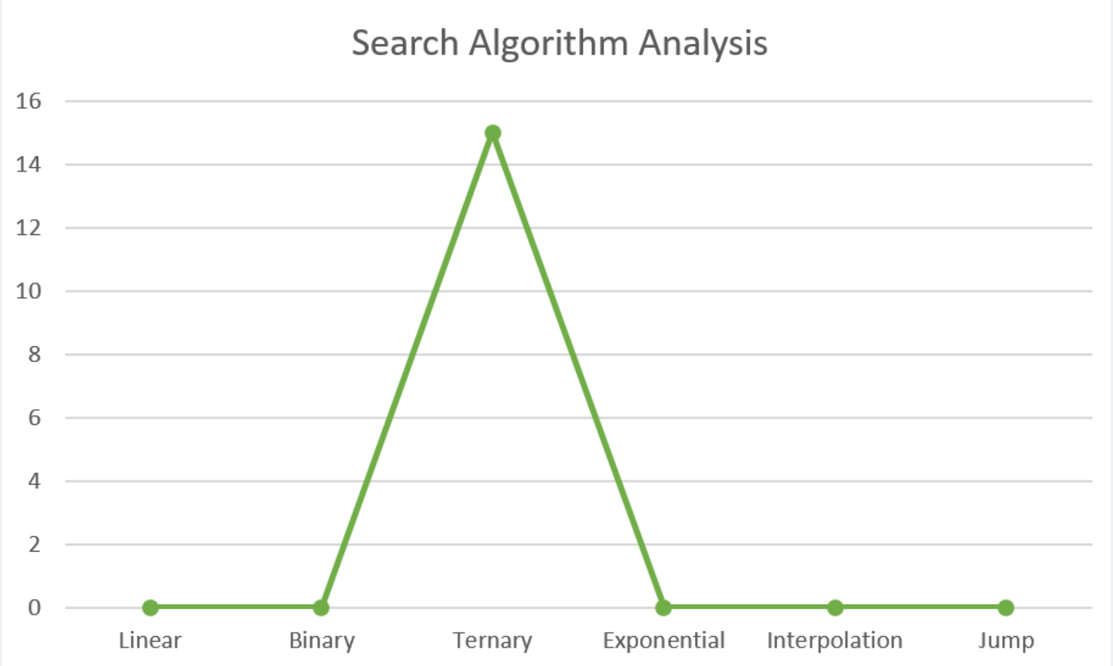
Large Data Set	
Linear	0
Binary	0
Ternary	5
Exponential	0
Interpolation	0
Jump	0

Home Page | Members | Worksheet

Search Algorithm Analysis Worksheet

Graph: Search Algorithm





a. Which search algorithm performed the best overall?

The results of the lab activity, as depicted in the search algorithm analysis worksheet table, highlight that the ternary search algorithm performed best overall. This conclusion is drawn from its consistently fast execution times across various data sets. Specifically, it demonstrated remarkable efficiency, averaging 0.009380000 milliseconds in the small data set, 0.012080002 milliseconds in the medium data set, and 0.023560002 milliseconds in the large data set. The overall performance, averaging 0.015006668 milliseconds, indicates its effectiveness in swiftly locating the target across different data sets. Additionally, the perfect score of 15/15 for all 15 targets in each of the three data sets underscores the algorithm's superb performance.

b. Did any search algorithms perform better on specific data sets?

Across all data set sizes (small, medium, large), the ternary search algorithm consistently outperformed other search algorithms. This means that, all throughout the execution of the lab activity, no alternative search algorithm exhibited superior performance compared to the ternary search algorithm. This highlights the algorithm's speed in finding the target and suggests its suitability for a wide range of data sets.

c. How did the size of the data set affect the performance of the search algorithms?

A noteworthy observation from the lab activity results is the correlation between data set size and search algorithm execution time. The larger the data set, the longer it took for the search algorithm to locate the target or the desired integer. This finding aligns with the general expectation that searching through larger data sets inherently requires more computational effort and time. It emphasizes the importance of selecting an efficient search algorithm, such as the ternary search algorithm, especially when dealing with substantial amounts of data to ensure optimal performance and responsiveness in finding the target.

d. Write a brief conclusion summarizing your findings.

In conclusion, the comprehensive analysis of various search algorithms in the lab activity has revealed valuable insights into their performance across different data set sizes. Among the algorithms tested, the ternary search algorithm performed best overall. Furthermore, the comparison across all data set sizes highlights the superiority of the ternary search algorithm over the other search algorithm. No other search algorithm surpassed its performance in any of the scenarios tested. Moreover, another important observation from the study is the direct relationship between data set size and search algorithm execution time. As expected, larger data sets necessitate longer search times. This emphasizes the importance of selecting a search algorithm that can efficiently handle increased computational demands. In practical terms, these findings suggest that the ternary search algorithm is a reliable and efficient choice for searching target integers across a wide range of data set sizes. Its consistent and exceptional performance makes it a recommended option for scenarios where quick and accurate target retrieval is essential. The insights gained from this lab activity contribute to a better understanding of search algorithm behavior and inform decision-making when implementing such algorithms in real-world applications.

Thank You!