CS 6301.002 IMPLEMENTATION OF ADVANCED DATA STRUCTURES AND ALGORITHMS

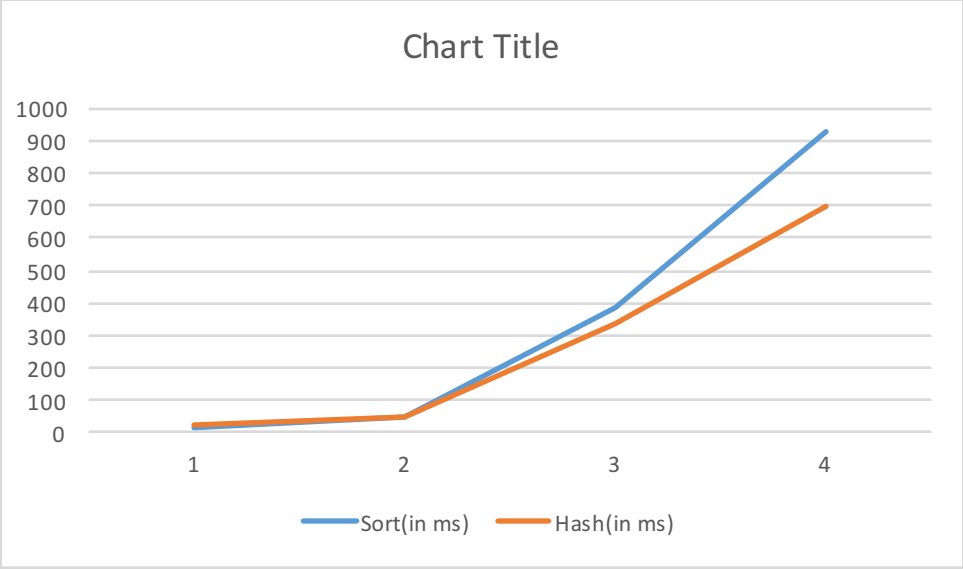
SHORT PROJECT 0 HASHING Question b

SUBMITTED BY : GROUP 05

Finding the most frequent elements using Sorting and HashMap:

We have implemented the algorithm to find the most frequent element in the array using two methods. Using the O(n logn) Sorting algorithm using Arrays.sort() and using the O(n) solution using Java's HashMap. The below table summarizes our performance analysis.

Input Size	Time (in milliseconds)		Memory (in MB)	
	Sorting	HashMap	Sorting	HashMap
100000	18	25	8/514	10/514
500000	52	45	12/514	18/514
1000000	388	332	88/514	114/514
25000000	928	698	208/514	342/649



Observations:

- From the above table and graph, it is found that the Java's HashMap is slow for small inputs, but as input size grows, the HashMap becomes faster than Sorting algorithm.
- The memory used by HashMap is more than the Sorting algorithm.

Note: The array was created using a Random Generator with bound of 100 for testing the program.