Kathmandu University

Department of Computer Science and Engineering

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Report of Lab1 :Algorithm and Complexity

[Code No: COMP 314]

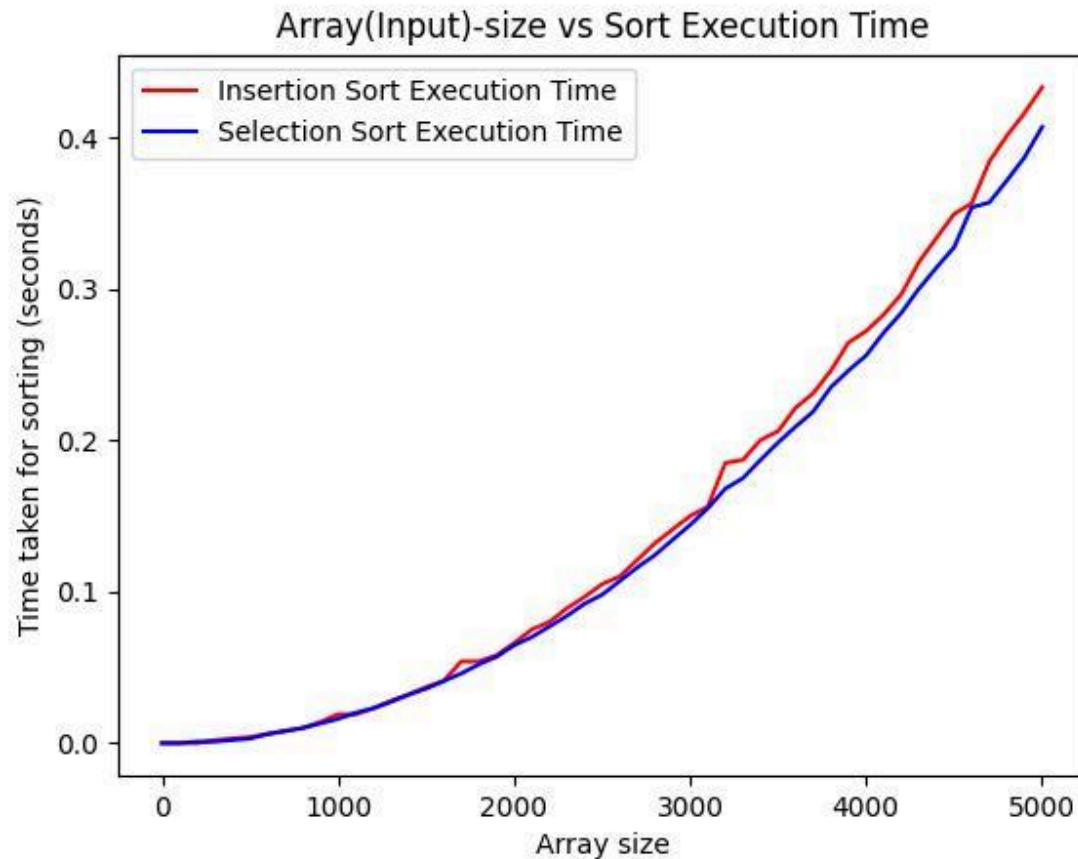**Submitted by:**

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Task: 3 and 4

Plot of input- size vs execution time graph

From the graph of the plot between Array(input) size vs Execution time for both insertion and selection sort we see that that they show the parabolic nature ie (time $=k*size^2$)

Insertion sort consists of two parts sorted and unsorted subarray where it iterates through the unsorted subarray, taking one element at a time and placing it in its correct position within the sorted subarray.

While selection sort repeatedly selects the smallest element from the unsorted portion of the array and swaps it with the element at the beginning of the unsorted portion until the array is sorted.

Even though the sorting mechanism of the two sorting algorithms the time complexity of both algorithms seems to be the same i.e. $O(n^2)$ as shown in the graph. These algorithms seem to be less efficient in sorting arrays of large size, as with increase in input size the time taken for sorting increases quadratically. So other sorting algorithms with less time complexity like merge sort($O(nlogn)$) can be used in their place.