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**Lab 1 Report**

**Code No: COMP 314**

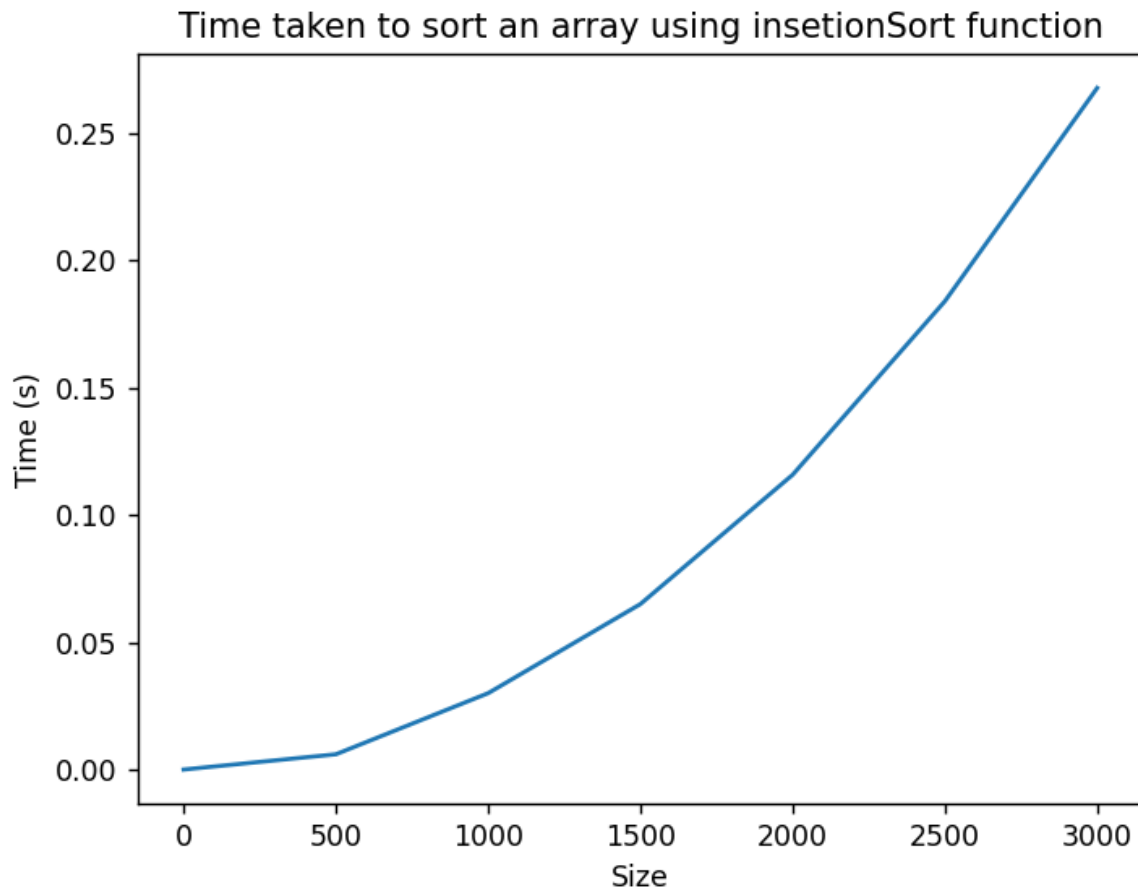
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## Insertion Sort

Insertion sort is an algorithm for sorting the data by iteratively selecting one element at a time and placing it in its correct position. It compares the first element of the unsorted part of the list and finds its correct place at the sorted part of the list and repeating it till the whole list is sorted. It has a time complexity of  $O(n^2)$  for average and worst case. The graph of the sorting algorithm with different data size if input is shown below:



From this we can see that the graph takes the form of  $y = x^2$ . Hence we can verify that the time complexity of insertion sort is  $O(n^2)$ .

## Selection Sort

The selection sort algorithm scans the whole list for the smallest element and places it at the first of the sorted part of the list. Then it finds the smallest element in the unsorted part of the list and places it at the end of the sorted list. This continues till the whole list is sorted and in this way the selection sort sorts the list. Selection sort has a time complexity of  $O(n^2)$  for average and worst case. The graph of the sorting algorithm with different data size if input is shown below:



From this we can see that the graph takes the form of  $y = x^2$ . Hence we can verify that the time complexity of selection sort is  $O(n^2)$ .