Lab2 - Assignment 5

Execution time for Insertion Sort and Merge Sort

When should one select merge sort over insertion sort?

Merge sort is more optimal for larger datasets, insertion sort when number of elements is small. Insertion sort can also be useful when input array is almost sorted (partially ordered), and when memory is restricted, as merge sort uses extra space proportional to N (Auxiliary Space Complexity = O(N)).

	Merge Sort	Insertion Sort
Worst Case	O(N*log(N))	O(N^2)
Average Case	O(N*log(N))	O(N^2)
Best Case	O(N*log(N))	O(N)
Auxiliary Space Complexity	O(N)	O(1)

Table Execution Time for randomised arrays

Array Size	Insertion Sort	Merge Sort
10	1ms	3ms
50	2ms	3ms
100	2ms	3ms
500	32ms	7ms
1 000	44ms	9ms
5 000	299ms	18ms
10 000	1s 261ms	78ms
50 000	16s 547ms	236ms
100 000		674ms
500 000		

1m 29s 604ms

1s 542ms