Indian Institute of Information Technology Vadodara

Lab Assignment 8

CS162: Introduction to Data Structures Laboratory

1. **Implement and compare the running time of Quick and Merge Sort.**
   Do as directed:
   a. Take an array of at least 100 numbers.
   b. Implement Quick and Merge Sort.
   c. Sort them using Quick and Merge Sort.
   d. Make the following measurements :
      i. Time for sorting when numbers are in random order.
      ii. Time for sorting when numbers are in ascending order.
      iii. Time for sorting when numbers are in descending order.
   e. Repeat these measurements for 10 times and take out the average value.
   f. Fill the table below with your readings and attach it with your submission file.

Note: Do not use any built in sorting libraries.

S.No.	Sorting Algorithm	Theoretical Time Complexity	Number of elements in the Array	Average Time (in ms) Random	Average Time (in ms) Ascending	Average Time (in ms) Descending
1.	Quick Sort					
2.	Merge Sort					

Hint:

A. Use the snippet below to calculate the time.

```
long start = System.nanoTime();
 // your code goes here
 long end = System.nanoTime();
 long elapsedTime = end - start;
```

Note: This code calculates time in nanoseconds. You need to report the time in milliseconds upto 3 decimal places

B. You can also use the random number generator to generate 100 numbers instead of hard coding them.