Assignment-1 of Algorithm Lab
4th Semester CST Dept

1-A: Construct large data sets taking random numbers from uniform distribution (UD)

1-B: Construct large data sets taking random numbers from normal distribution (ND)

2-A: Implement Merge Sort (MS) and check for correctness

2-B: Implement Quick Sort (QS) and check for correctness

3. Count the operations performed, like comparisons and swaps with problem size increasing in powers of 2, for both MS and QS with both UD and ND as input data.

4. Experiment with randomized QS (RQS) with both UD and ND as input data to arrive at the average complexity (count of operations performed) with both input datasets.

5. Now normalize both the datasets in the range from 0 to 1 and implement bucket sort (BS) algorithm and check for correctness.

6. Experiment with BS to arrive at its average complexity for both UD and ND data sets and infer.

7. Implement the worst case linear median selection algorithm by taking the median of medians (MoM) as the pivotal element and check for correctness.

8. Take different sizes for each trivial partition (3/5/7 ...) and see how the time taken is changing.

9. Perform experiments by rearranging the elements of the datasets (both UD and ND) and comment on the partition or split obtained using the pivotal element chosen as MoM.