**Home Assignment-2 (CS204)**

Please solve all the problems given below. Contact Prashant <prashant.pcs17@iitp.ac.in>; and Deeksha <[1821cs13@iitp.ac.in](mailto:1821cs13@iitp.ac.in)> for any difficulties. Question 1<c> and 1<d> and 3 will be evaluated while other questions are practice problems. You have to solve it and submit it by 7th September (to Prashant/Deeksha) in an A4 sheet. Please write your name and roll number and sign in the A4 sheet.

1. Please argue if the following sorting algorithms are stable or not
   1. Insertion Sort
   2. Merge Sort
   3. Heap Sort [2]
   4. Quick Sort [2]
   5. Radix sort
2. Please discuss limitation and applicability of following linear sorting algorithms
   1. Counting sort
   2. Bucket sort
3. Why the sorting algorithm needs to be stable for each digit in radix sort? [2]
4. Why in radix sort digits are sorted from LSB to MSB? Is it possible to get a correct sorting if we sort from MSB to LSB?
5. Write a quick-sort algorithm (only pseudo code) which is guaranteed to be of O(nlogn)