LAB – 2 (Due: 12(Sunday) August 2018 till 10pm)

Objective: To analyze the sorting algorithms empirically on sorted (ascending order), random and sorted (descending order) lists to appreciate best case, worst case and average case complexities.

1a. Generate the input text files with sizes 100, 1000, 10,000 and 100,000 containing integers(also -ve numbers through set the range such as -100 to 100 for size of 100) in

(i) sorted (ascending order)
(ii) random
(iii) sorted (descending order)

Save input text file as “in_asce100.txt”, “in_ran1000.txt”, “in_desc10000.txt”

1b. Write two programs implementing Quick sort taking pivot as first element and random element using input text files from Question 1a.

Display the total number comparisons and total number of swaps done by the respective program on respective input text files in tabular format in a “readme.txt” file.

Save the output text files such as “out_asce100.txt”, “out_ran1000.txt”, “out_desc10000.txt”.

Syntax of Input file

```
5     [total number of elements]
5     [element-1]
-3    [element-2]
0     [element-3]
2     [element-4]
-1    [element-5]
```

Syntax of sorted Output file
10 [number of comparison]
4 [number of swap]
-3
-1
0
2
5

2a. Generate the input text files with sizes 50, 100, 500 and 1000 containing integers(range such as 0 to 10 for size of 50), save as “in_random50.txt” or “in_random500.txt”.

2b. Write a program of Counting sort using the input text files from Question 2a. Generate and save the output text files such as “out_random50.txt” or “out_random500.txt”. Follow the I/O syntax convention of Question 1.

Check list:-
1a: number of input text files 12.
1b: number of output text files 12+1(readme.txt).
2a: numebr of input text files 4.
2b number of output text files 4.
along with the other program files.

Submission Policy: Create a zip file as 18MCMT01.tar, containing your programs, input/output files. And mail it to algolab2018@gmail.com with subject example “18MCMT01_Lab-2”.