Indian Institute of Engineering Science and Technology, Shibpur. Department of Information Technology

Data Structure Laboratory 2020

BATCH- HY Due Date: 08.10.2020

Assignment 4

1. Write a program that takes a single positive integer (say N) as a command line argument, generates N random integers between 0 and 10, 000. Insert them (one by one) into a list in sorted order. Assume the list is initially empty.

Example: Generated elements: 8, 5, 10, 1, . . . List: 8 → 5 8 → 5 8 10 → 1 5 8 10.
I. Use the same process for storing the elements using : (a) an array; (b) a linked list;
II Run your program 6 times each for N = 100, 500, 1000, 2000, 3000, . . ., 10000.
Print the sorted list to standard output, and the time taken (followed by a single tab, but no newline) to standard error.
II. Find the average time taken for each value of N and for each implementation method given above.

2. You are given a linked list of linked lists. Write a program to create a singly linked list as shown in the following example.

Input
2 → 6 →21 →25
↓ ↓ ↓ ↓
1 11 22 35
↓ ↓ ↓
8 50 47
↓ ↓
19 89
Output 2 → 1 → 8 → 19 → 6 → 11 →50 → 89 → 21 → 22 →47 → 25 → 35
Take input from a file with following format:
Line 1: # Number of lists
Line 2: Elements of List 1
Line 3: Elements of List 2
And so on