Data Structures and Algorithms

Mid-Semester Assignment

Faculty: Muhammad Adil Asst: Prof.

Spring-2020

Name = Muhammad Yasir

ID = 15459

Date:

Q#1 → a → Part:-

Let the size of A[] be 15654 and the lower bound be 36767, calculate the upper bound.

Sol

lb = 36767

ub = ?

As of A[] = ub - lb + 1

ub = Size of A[] + lb - 1

ub = 15654 + 36767 - 1

ub = 52,420 Ans

b-Part):- Suppose a list of 350 elements is to be sorted using Bubble Sort, then find

i) Total Number of Passes
ii) " " " steps
iii) Number of steps in Pass#137
iv) Number of steps in Pass#193

Sol:-

1) No of Passes = n-1
$\Rightarrow 350-1 = 349$

2) No of steps = $\frac{n(n-1)}{2} \Rightarrow \frac{350(349)}{2} \Rightarrow 61,075$

3) No of steps in pass 137 = n-Pass no
$\Rightarrow 349-193 \Rightarrow 156$

4) No of steps in Pass 193 = 349-193 $\Rightarrow$ 156

Date: _____

Q2#) Sort the given list using Slection sort.

10, 15, 0, 7, 8, 6

Soln

n = 6

step = n - 1 = 6 - 1

n = 5

step 1 - Element = 10

(10) →, 15, ← (0), 7, 8, 6

step 2 - Element = 15

0, (15) →, 10, 7, 8, ← (6)

step 3 - Element = 10

0, 6, (10) →, ← (7), 8, 15

Step 4 - Element = 10

0, 6, 7, (10), (8), 15

Step 5 - Element = 10

0, 6, 7, 8, (10), 15

So,

10 is it Proper Position.

0, 6, 7, 8, 10, 15

List Sorted.

Q#3. Fill in the blanks.

i. ___**Physical**___ Data Structure may deal with only a single value.

ii. __**Logical**___Data Structure may deal with multiple values.

iii. The logical / mathematical organization of data is called ___**Data_Structure**___.

iv. A Tree is a __**Non-linear**___ Data Structure.

v. An Array is a __**Linear**__ Data Structure.

vi. List must be sorted for ___**Linear**___ Searching.

vii. 17 int-div 2 = __**8**__.

viii. An investigation parade of criminals is an example of __**File**__.

ix. Number of Fields in a Record is called ___***Degree*_Of_Record**____.

x. Number of Records in a Block is called ___**Blocking__Factors**____.