NAME : JANZAID KHALIQ
ID : 15386
PAPER : DATA STRUCTURE & ALOGORITHMS
EXAM : MID TERM SPRING 2020
TEACHER : SIR ADIL
DATE : 20/4/20

Q1a:- Let the size of A[] be 15654 and the lower bound be 36767, Calculate the upper bound.

Solution :-

Size of A[] = Ub - lb + 1
Ub = Size of A[] + lb - 1
Ub = 15654 + 36767 - 1
Ub = 52420

b) Suppose a list of 350 elements is to be sorted using bubble sort, then find

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

Solution :-

$$n = 350$$

i) Total number of Passes $= n - 1$
$= 350 - 1 = 349$

ii) Total number of steps $= \frac{n(n-1)}{2}$
$= \frac{350(350-1)}{2}$
$= 175(349)$
$= 61,075$

iii) number of steps in Pass # 137
$= n - \text{Pass \#}$
$= 350 - 137 = 213$

iv) number of steps in Pass # 193
$= n - \text{Pass \#}$
$= 350 - 193$
$= 57$

Q2 :- Sort the given list using selection Sort :
10, 15, 0, 7, 8, 6

Solution :-

$n = 6$

Steps $= n - 1$
$= 6 - 1 = 5$

Step # 1 :- Element = 10
(10), 15, (0), 7, 8, 6 (swapping)
0, 15, 10, 7, 8, 6

Step # 2 :- element = 15
0, (15), 10, 7, 8, (6) (swapping)
0, 6, 10, 7, 8, 15

Step # 3 :- element = 10
0, 6, (10), (7), 8, 15 (swapping)
0, 6, 7, 10, 8, 15

Step # 4 :- element = 10
0, 6, 7, (10), (8), 15 (swapping)
0, 6, 7, 8, 10, 15

Step # 5 :- element = 10
0, 6, 7, 8, (10), 15

10 is at its Proper Position.
0, 6, 7, 8, 10, 15

List is Sorted.

Q3:- Fill in the blanks.

i) Physical Data structure may deal with only a single value.

ii) Logical Data structure may deal with multiple value.

iii) The logical/Mathematical organization of data is Called Data structure Programming.

iv) A Tree is a NON-Linear Data structure.

v) An Array is a Linear Data structure.

vi) List must be sorted for Binary searching.

vii) 17 int-div 2 = 8.5.

viii) An Investigation Parade of Criminals is an example of -.

ix) Number of fields in a Record is Called degree of Record.

x) Number of Records in a Block is Called Blocking factor.