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PAPER : DATA STRUCTURES AND  
ALGORITHMS.

- Attempt All Tasks.

QUESTION: 1  
(a).

Let the size of  $A[]$  be 15654 and the lower bound be 36767. Calculate the upper bound.

DATA:-

$$\text{Size of } A[] = 15654.$$

$$\text{Lower bound} = 36767.$$

REQUIRED:-

$$\text{Upper bound} = ?$$

SOLUTION:-

So, the formula is  
Size of Array =  $ub - lb + 1$ .

$$15654 = ub - 36767 + 1.$$

$$15654 = ub - 36768$$

$$15654 + 36768 = ub.$$

$$ub = 52422 \quad \text{Answer.}$$

QUESTION: 1.

(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:-

Given:-

$$n = 350.$$

\* Required:-

(i) Total number of Passes = ?

$$\text{total no. of passes} = n - 1.$$

$$= 350 - 1 = 349.$$

(ii) Total Number of steps = ?

$$\text{formula:-} \frac{n(n-1)}{2}$$

$$\text{total number of steps} = \frac{n(n-1)}{2}$$

$$= \frac{350(350-1)}{2}$$

$$= \frac{122150}{2}$$

$$\text{Total Number of Steps} = 61075.$$



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(iii) Number of steps in Pass # 137.

formula for finding this is  $n - i$ .

$i = \text{step number}$ .

$$n - i = 350 - 137.$$

$$\boxed{n - i = 213}$$

(iv) Number of steps in Pass # 193.

formula:  $n - i$

$$n - i = 350 - 193.$$

$$n - i = 157.$$

Question no. 2 :-

Sort the given list using Selection Sort.

10, 15, 0, 7, 8, 9.

\* SOLUTION :-

Given: total number of  $n = 6$ .

Steps:  $n - 1$

$= 6 - 1 \Rightarrow \text{Steps} = 5$ .

\* Step: 1 :-

Element = 10.

10, (15), (0), 7, 8, 9.

\* Step: 2 :-

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

\* Step: 3 :-

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

\* Step: 4 :-

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

0, 6, 7, 8, 10, 15.

Hence

Step: 5 :-

10 is at proper position  
List Sorted.



Question: 3 :-

Fill in The Blanks.

(1) Physical.

(2) Data structure.

(3) logical.

(4) no-linear.

(5) linear.

(6) linear.

(7) 8

(8) File.

(9) Degree of record

(10) Blocking factor.