

1. (c) Binary Search Algorithm: Binary search Algorithm is a searching algorithm to find the index (for Array) or location of any element.

Algorithm to find element by binary search :

1. Set $Beg = l$, $end = R$,
 $mid = \text{int}((Beg + end)/2)$
2. Repeat step 3 and 4 while
 $beg \leq end$ and $data[mid] \neq \text{value}$.
3. if $\text{value} < data[mid]$,
 set $end = mid - 1$
 else $beg = mid + 1$
4. $mid = \text{int}((beg + end)/2)$
5. if $data[mid] = \text{value}$
 then $\text{Find-Loc} = mid$
 (end of if)
6. exit

Ans to the Q. no. - 2(b)

We can insert a new node at the end of a linked list using following Algorithm.

step 1: Declare temp_node.

If temp_node = NULL

write overflow

go to step 10

step 2: set new_node = temp_node

step 3: set temp_node = temp_node → next

step 4: set new_node → data = value

step 5: new_node → next = NULL

step 6: temp_node = head

step 7: Repeat 8 while temp_node → next != NULL

step 8: set temp_node = temp_node → next

(loop end)

step 9: temp_node → next = new_node.

step 10: Exit

①

Ans to the Q. no. 2 (b)

Algorithm to insert a new node at the beginning :

step-1 : If PTR = NULL

print overflow

exit

else, allocate the space for the new node.

step-2 : New-node = PTR

step-3 : PTR = PTR \rightarrow next

step-4 : New-node \rightarrow data = Value

step-5 : new-node \rightarrow next = Head (where Head is the first node)

step-6 : ~~new~~ Head = New-node

step-7 : exit

① (b)

$A = (34, 23, 66, 48, 44, 51, 27, 85, 29, 15, 31)$

Here, $N=11$, so, 11 elements are in here.

compare 34 and 23 $34 > 23$ so they are

interchange.

23 34 66 48 44 51 27 85 29 15 31

$34 < 66$ (not interchange)

23 34 66 48 44 51 27 85 29 15 31

$66 > 48$ (interchange)

23 34 48 66 44 51 27 85 27 15 31

$66 > 44$ (interchange)

23 34 48 44 66 51 27 85 27 15 31

$66 > 51$ (interchange)

23 34 48 44 51 66 27 85 27 15 31

$66 > 27$ (interchange)

23 34 48 44 51 27 66 85 27 15 31

$85 > 66$ (not interchange)

23 34 48 44 51 27 66 85 27 15 31

by this way 85 is interchanged
and finally 85 is stored on $n-1(10)$
index

23 34 48 44 51 27 66 27 15 31 85

Again operation from first this procedure

\therefore final result: 15 23 27 27 31 34 44 48 51 66 85

4. a)

(2) (c) given $G = A + (B * C - (D / E \wedge F) * G) * H$

Character Scanned	stack	Postfix Expression
A	(A
+	(+	A
((+(A
B	(+(AB
*	(+(*	AB
C	(+(*	ABC
-	(+(-	ABC*
((+(-(ABC*
D	(+(-(ABC*D
/	(+(-(/	ABC*D
E	(+(-(/	ABC*DE
^	(+(-(/ ^	ABC*DE
F	(+(-(/ ^	ABC*DEF
)	(+(-	ABC*DEF ^ /
*	(+(- *	ABC*DEF ^ /
G	(+(- *	ABC*DEF ^ / G
)	(+	ABC*DEF ^ / G * -
*	(+*	ABC*DEF ^ / G * -
H	(+*	ABC*DEF ^ / G * - H
)		ABC*DEF ^ / G * - H * +

2 (a) Garbage collection : In linked list, sometimes we insert element on linked list. For this new node, need extra memory, space. Again we also delete any element from linked list. but there will be memory space for deleted element that are garbage collection.

Overflow : overflow means when we insert any element on array but there is no available space, i.e., the free storage list is empty.

Underflow : The term underflow refers to the situation where one wants to delete data from a data structure that is empty.

① (a)

Data Structure : Data structure is a procedure where data are stored in a sequential manner.

Difference Between Linear and Non Linear Data structure

Linear data structure

1. Every item is related to its previous and next item.

2. Data is arranged sequentially

3. Data item can be traversed in a single run.

4. Implementation is easy

Non linear data structure

1. Every item is related with many other items.

2. Data is not arranged sequentially.

3. Data item can not be traversed in a single run.

4. Implementation is difficult.