

Time Complexity

33. Show that $n^2 + 50n = O(n^2)$.

34. Show that $n^2 + n^2 + n^2 = 3n^2 = O(n^3)$.

Prove Your Answer

10. The running time complexity of a linear time algorithm is given as

- | | |
|-------------------|--------------|
| (a) $O(1)$ | (b) $O(n)$ |
| (c) $O(n \log n)$ | (d) $O(n^2)$ |

12. Which notation comprises a set of all functions $h(n)$ that are greater than or equal to $cg(n)$ for all values of $n \geq n_0$?

- | | |
|----------------------|--------------------|
| (a) Omega notation | (b) Big O notation |
| (c) Small o notation | (d) Theta Notation |

25. $540n^2 + 10$ _____ $\Omega(n^2)$.

Which one grows faster?

$\log(N)$ versus $\text{sqrt}(N)$

N^3 versus $10000 * N^2$

$\log^2(N)$ versus $10 * \log(N^5)$

Linked List

Multiple-choice Questions

1. A linked list is a
 - (a) Random access structure
 - (b) Sequential access structure
 - (c) Both
 - (d) None of these
2. An array is a
 - (a) Random access structure
 - (b) Sequential access structure
 - (c) Both
 - (d) None of these
3. Linked list is used to implement data structures like
 - (a) Stacks
 - (b) Queues
 - (c) Trees
 - (d) All of these
4. Which type of linked list contains a pointer to the next as well as the previous node in the sequence?
 - (a) Singly linked list
 - (b) Circular linked list
 - (c) Doubly linked list
 - (d) All of these
5. Which type of linked list does not store NULL in next field?
 - (a) Singly linked list
 - (b) Circular linked list
 - (c) Doubly linked list
 - (d) All of these
6. Which type of linked list stores the address of the header node in the next field of the last node?
 - (a) Singly linked list
 - (b) Circular linked list
 - (c) Doubly linked list
 - (d) Circular header linked list

True or False

1. A linked list is a linear collection of data elements.
2. A linked list can grow and shrink during run time.
3. A node in a linked list can point to only one node at a time.
4. A node in a singly linked list can reference the previous node.
5. A linked list can store only integer values.
6. Linked list is a random access structure.
7. Deleting a node from a doubly linked list is easier than deleting it from a singly linked list.
8. Every node in a linked list contains an integer part and a pointer.

Fill in the Blank and **Explain Your Answer**

2. The complexity to insert a node at the beginning of the linked list is _____.
4. Inserting a node at the beginning of the doubly linked list needs to modify _____ pointers.
6. Inserting a node at the end of the circular linked list needs to modify _____ pointers.

8. Deleting a node from the beginning of the singly linked list needs to modify _____ pointers

10. Deleting a node from the end of a circular linked list needs to modify _____ pointers.

12. First node in the linked list is called the _____.

14. Overflow occurs when _____.