Aror University of Art, Architecture, Design and Heritage
SUKKUR,Sindh
Department of Multimedia and Gaming
Course: Data Structures CSC-221 (Practical)
Instructor: Engr. Fatima Jaffar

Lab No. 04

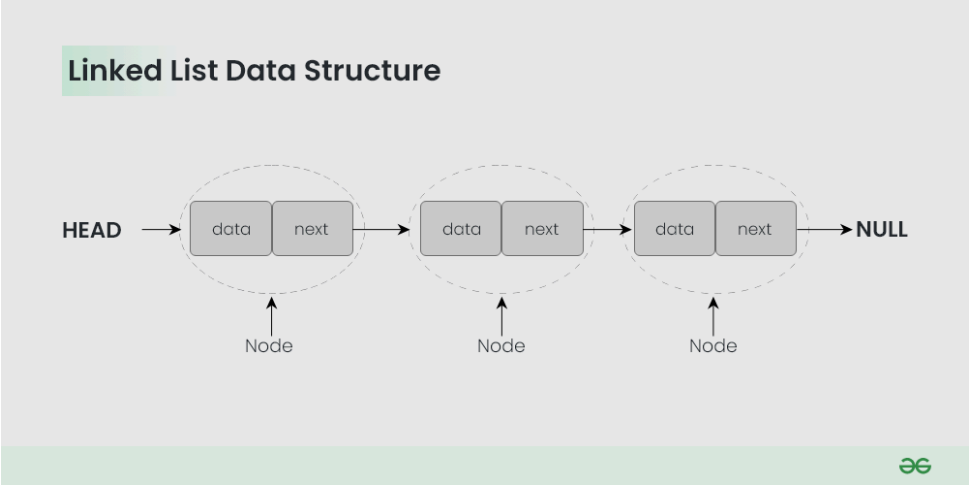
Objective: Understanding Singly linked List

Name: _____ _____ **Roll Number:** _____

Score: _____ **Signature:** _____ **Date:** 11/09/2024

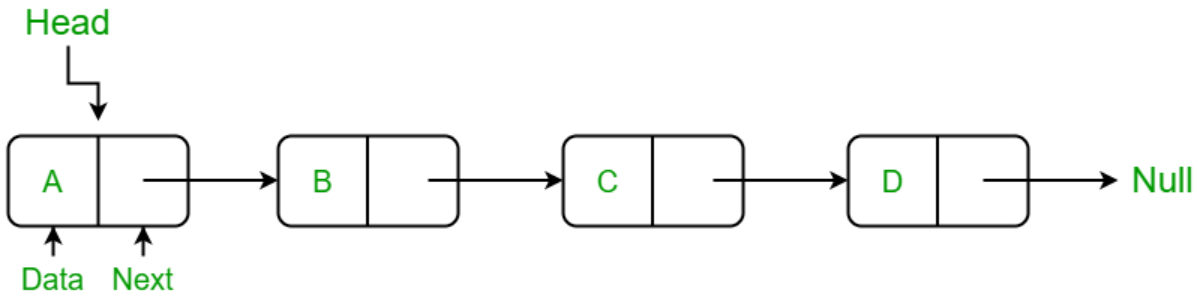
Introduction:

A linked list is a linear data structure, in which the elements are not stored at contiguous memory locations. The elements in a linked list are linked using pointers as shown in the below image:



Singly Linked List:

A singly linked list is a linear data structure in which the elements are not stored in contiguous memory locations and each element is connected only to its next element using a pointer.



Linked List Operations:

There are various linked list operations that allow us to perform different actions on linked lists. For example, the insertion operation adds a new element to the linked list.

Here's a list of basic linked list operations that we will cover in this article.

Insertion - adds a new element to the linked list

Traversal - access each element of the linked list

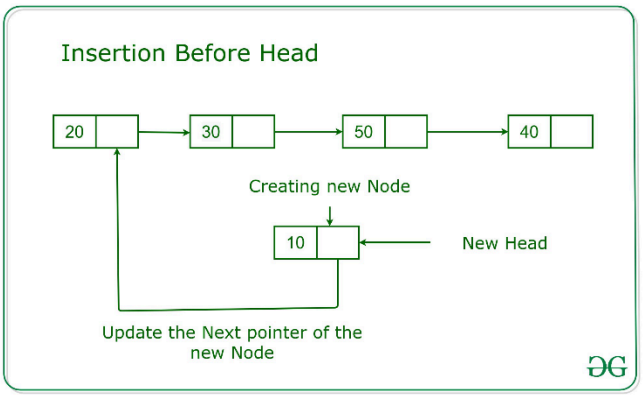
Deletion - removes the existing elements

Search - find a node in the linked list

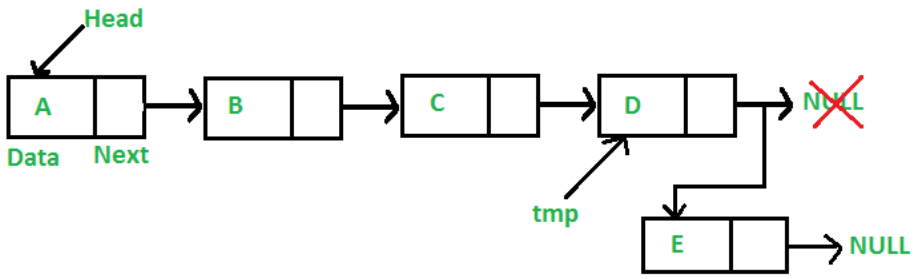
Sort - sort the nodes of the linked list.

1. Insertion:

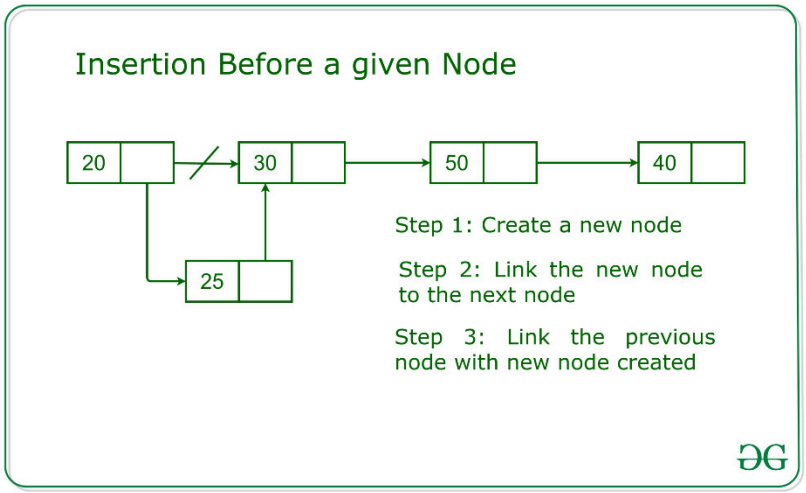
1.1. Insert first node



1.2. Insert Last node:



1.3. Insert after a specific node



Implementation of Linked list in java

```
public class LinkedList{
Node Head;
}
public class Node{
Node next;
int data;
public Node(int val, Node next){
val=this.data;
next=this.next;
} }
```

Lab Tasks

1. Write a program to Create a linked list, with at least 5 nodes.
2. Write a program to print all the elements of linked list
3. Write a program to count the number of nodes in linked list
4. Write a program to print the middle node of a linked list
5. Write a program to find a specific node of a linked list.
6. Write a program to insert a new node at the beginning of Linked list.
7. Write a program to insert a new node in the end of Linked list
8. Write a program to insert a new node on a specific position in the linked list
9. Write a program to delete first node in the Linked list.
10. Write a program to delete last node in the Linked list.
11. Write a program to delete an specific node, given the position of that node.