



# Data Structures

lecture 11  
14-10-2022



# **Last Session Quick Revision**



## Unit 2: Linked List

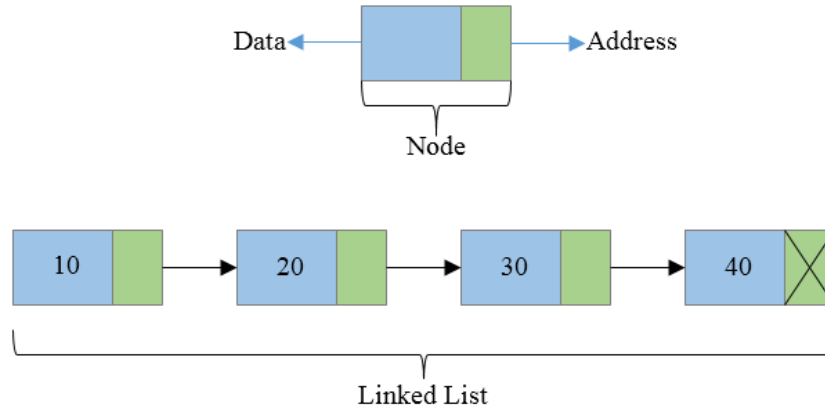
# What is Linked List

- Linear Data Structure
- consists series of connected elements called nodes.



# Node in the linked List

- Consists two parts
  1. Data part: stores actual info on that node
  2. Next Part: contains address of next node



# General Observation of Linked List

- Contains pointer to first node called start/head
- Each Node carries a data field and a link field called next.
- Each Node is linked with its next link using its next link.
- **Last Node** carries a link as **NULL** to mark the end of the list.



# Linked List Types

- Simple Linked List (Singly Linked List)
- Doubly Linked List
- Circular Linked List
  - Singly circular
  - Doubly circular

# Singly Linked List

- Simple Linked List (Singly Linked List)
  - One data and One next



- Item navigation is forward only.



# Doubly Linked List

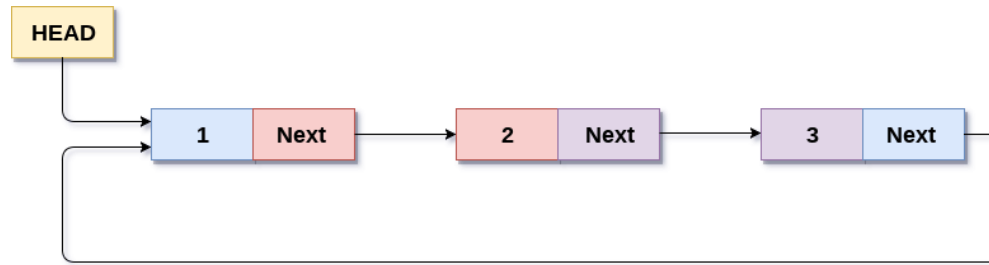
- Doubly Linked List
  - One data one previous and one next



- can be navigated forward and backward.

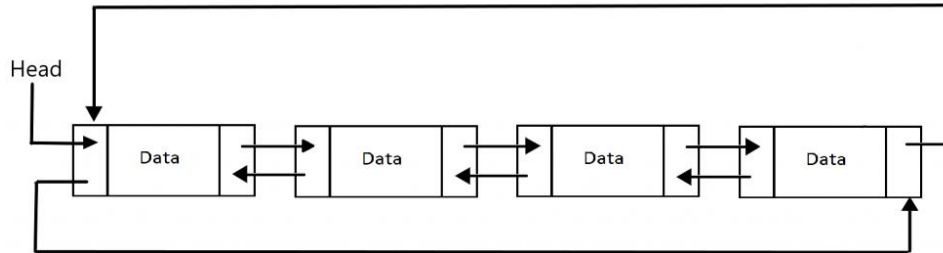
# Singly Circular Linked List

- Last node contains address of first node.



# Doubly Circular Linked List

- Last node contains address of first node and vice versa.



# Basic Operations on the Linked List

- **Insertion** – Adds an element in the list.
- **Traverse / Display** – visit every element and display the complete list.
- **Retrieval / Search** – Searches an element using the given key.
- **Delete** – Deletes an element

## Insert Operation: Insert at the end



## Insert Operation: Insert at the beginning



## Insert Operation: Insert at specific position



# Search Element in Linked List

