# Linked List

When we want to work with an unknown number of data values, we use a linked list data structure to organize that data. The linked list is a linear data structure that contains a sequence of elements such that each element links to its next element in the sequence. Each element in a linked list is called "***Node***".

A ***Node*** contains two fields: **data** stored at that particular address and the **pointer** which contains the address of the next node in the memory. The last node of the list contains pointer to the **null**.

## Types of Linked List

Following are the various types of linked list.

1. Simple Linked List − Item navigation is forward only.
2. Doubly Linked List − Items can be navigated forward and backward.
3. Circular Linked List − Last item contains link of the first element as next and the first element has a link to the last element as previous.

### Simple/Single Linked List

Simply a list is a sequence of data, and the linked list is a sequence of data linked with each other. The formal definition of a single linked list is as follows:

Single linked list is a sequence of elements in which every element has link to its next element in the sequence.

In any *single linked list*, the individual element is called as "**Node**". Every "**Node**" contains two fields, **data field**, and the **next field**. The **data field** is used to store actual value of the node and **next field** is used to store the address of next node in the sequence. The graphical representation of a node in a single linked list is as follows:

**Data**

**Link**

**Stores actual data**

**Stores address of next node**

#### Important Points to be Remember

* ***In a single linked list, the address of the first node is always stored in a reference node known as "front" or "head".***
* ***Always next part (reference part) of the last node must be NULL.***

#### Linked List Representation

Linked list can be visualized as a chain of nodes, where every node point to the next node.

**10**

**1010**

**1012**

**head**

**1012**

**1010**

**1008**

**1006**

**44**

**1008**

**65**

**1006**

**43**

**NULL**

#### Operations on Single Linked List

The following operations are performed on a Single Linked List

1. Insertion
2. Deletion
3. Display
4. Search

Before we implement actual operations, first we need to set up an empty list. First, perform the following steps before implementing actual operations.