Module 1

Data Structure

The logical or mathematical model of a particular organization of data is called a data structure.

Types of Data Structure

1. Primitive Data Structure

Structures which are supported at the machine level, can be used to make non-primitive data structure. These are integral and are pure in form. They have predefined behavior and specification.

eg:- float, character, integer, pointer

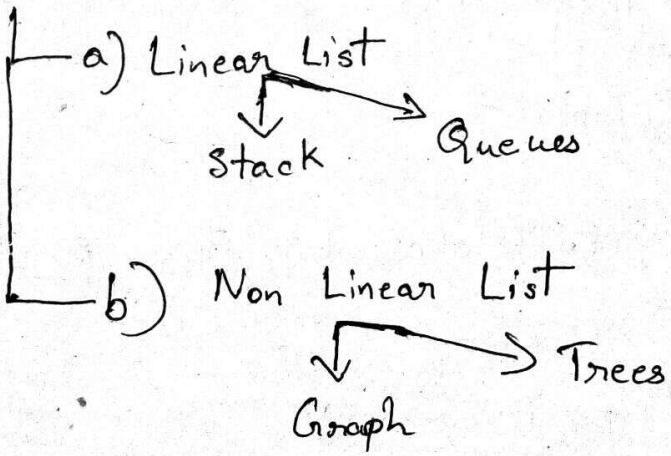
Since pointer hold memory addresses it is also known as the reference data types.

2. Non-primitive Data Structure

The non-primitive data structure cannot be performed without the primitive data structures. Although, they too are provided by the system itself yet they are derived data structures and cannot be formed without using the primitive data structures.

Types of Non-Primitive Data Structure

1. Array
2. Files
3. Lists



Array

Array are a homogeneous and contigous ~~type~~ collection of same data types. They have a static memory allocation technique, The arrays are used to implement vectors, matrices and other data structure.

Files

A file is a collection of records. The file data structure is primarily used for managing large amounts of data which is not in the primary storage of the system. Files help us to process manage, access & retrieve or basically work with such data; easily.

List

List supports dynamic memory allocation. The memory space allocated, can be changed at run time also.

List are of two types

1. Linear List
2. Non-Linear List

Linear List

Linear list are those which have the elements stored in a sequential order. The insertions & deletions are easier in the list They are divided into two types:

* Stack
* Queues

Stack

Stack follows a "LIFO" technique for storing and retrieving elements. The elements which is stored at the end will be the first one to be retrieved from the stack.

Primary functions of Stack:

* Push(): To insert an element in Stack
* Pop(): To remove an element from Stack

Queue

Queue follows FIFO mechanism for storing & retrieving elements. The elements which are stored Ist into the queue will only be the Ist elements to be removed out from the queue.

Operations used in Queue are

1. ENQUEUE - is used to insert an element into queue
2. DEQUEUE - used to remove an element from queue

Non Linear Lists

~~Graphs : Us~~

The non-linear list do not have elements stored in a certain manner. They are:

1. Graph
2. Trees

Graphs

Used to represent a network. It comprises of vertex & edges. The graphs are useful when it comes to study network.

Trees

Tree data structure comprises of nodes connected in a particular arrangement & they make search operations on the data items easy The tree data structure consist of root nodes which is further divided into various child nodes. The number of levels of the tree is also called height of trees.