Notes of Data Structure

⊛ Defination of data structure :-

A data structure is a particular way of storing and organizing data in a computer so that it can be used effectively.

↳ purpose is efficent use of data.

↳ Some examples of data structure are :-
→ Array
→ Linked List
→ Stack
→ Queue etc.

↳ Data Structure are widely used in almost every aspect of computer science i.e. operating System, Artifical Intelligence, Graphics and many more.

↳ Data Structure are categorised into two types :-

1) Primitive data Structure
2) Non-Primitive data Structure

Types of data Structure

Primitive data Structure — int, float, char, Pointers

Non-Primitive Data Structure — Linear data Structure, Non-linear data Structure

1 **Primitive data Structure :-**

It represents fundamental data types which are supported by Programming language.

E.g:- int, float, char.

2. **Non Primitive data Structure :-**

These data structure can be built by using primitive data Structure.

* Non Primitive data structure again classified into two types :-

        (i) Linear data Structure
        (ii) Non- Linear data Structure
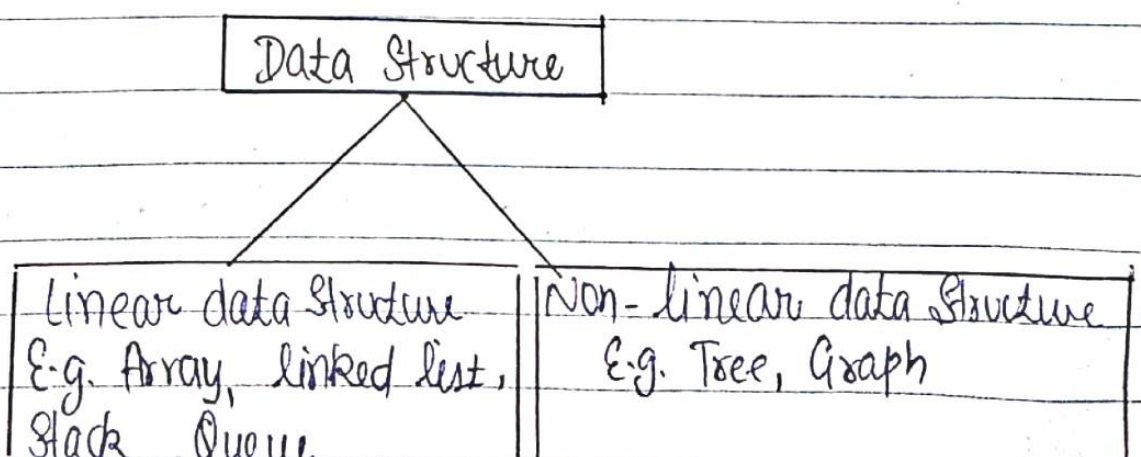
(i) Linear Data Structure :-

The elements in a linear data structure form a linear sequence.
      Example :- Array, Linked List, Queue, Stack etc

(ii) Non-Linear Data Structure :-

The elements in a non-linear data structure do not form any linear sequence.
      Example :- Tree, Graph.

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                    ┌─────────────────┐
                    │ Data Structure  │
                    └────────┬────────┘
                    ┌────────┴────────┐
   ┌────────────────────────┐  ┌──────────────────────────┐
   │ Linear data Structure  │  │ Non-linear data Structure │
   │ E.g. Array, linked list,│  │ E.g. Tree, Graph         │
   │ Stack, Queue           │  │                          │
   └────────────────────────┘  └──────────────────────────┘
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* Static and Dynamic Data Structures :-

• Static Data Structure:-

- Static data structure are those whose memory occupation is fixed.
- The memory take by these data structure cannot be increased or decreased at run time.
- Example :- Array.

• Dynamic Data Structure :-

- Dynamic data structure are those whose memory occupation is not fixed.
- The memory taken by these data structure can be increased or decreased at run time.
- Example :- Linked list.
  (The size of linked list can be changed during the run time).

* Homogenous and Non-Homogeneous Data Structure

- ### Homogeneous Data Structure :-

Homogeneous data structure are those in which, data of same type can be stored.

  example :- Array.

- ### Non-Homogenous Data Structure :-

Non-Homogeneous data structure are those in which data of different types can be stored.

  Example :- Linked list.