INTRODUCTION

TO

DATA STRUCTURE

Topics To Be Discussed……

- ✓ **Meaning of Data Structure**

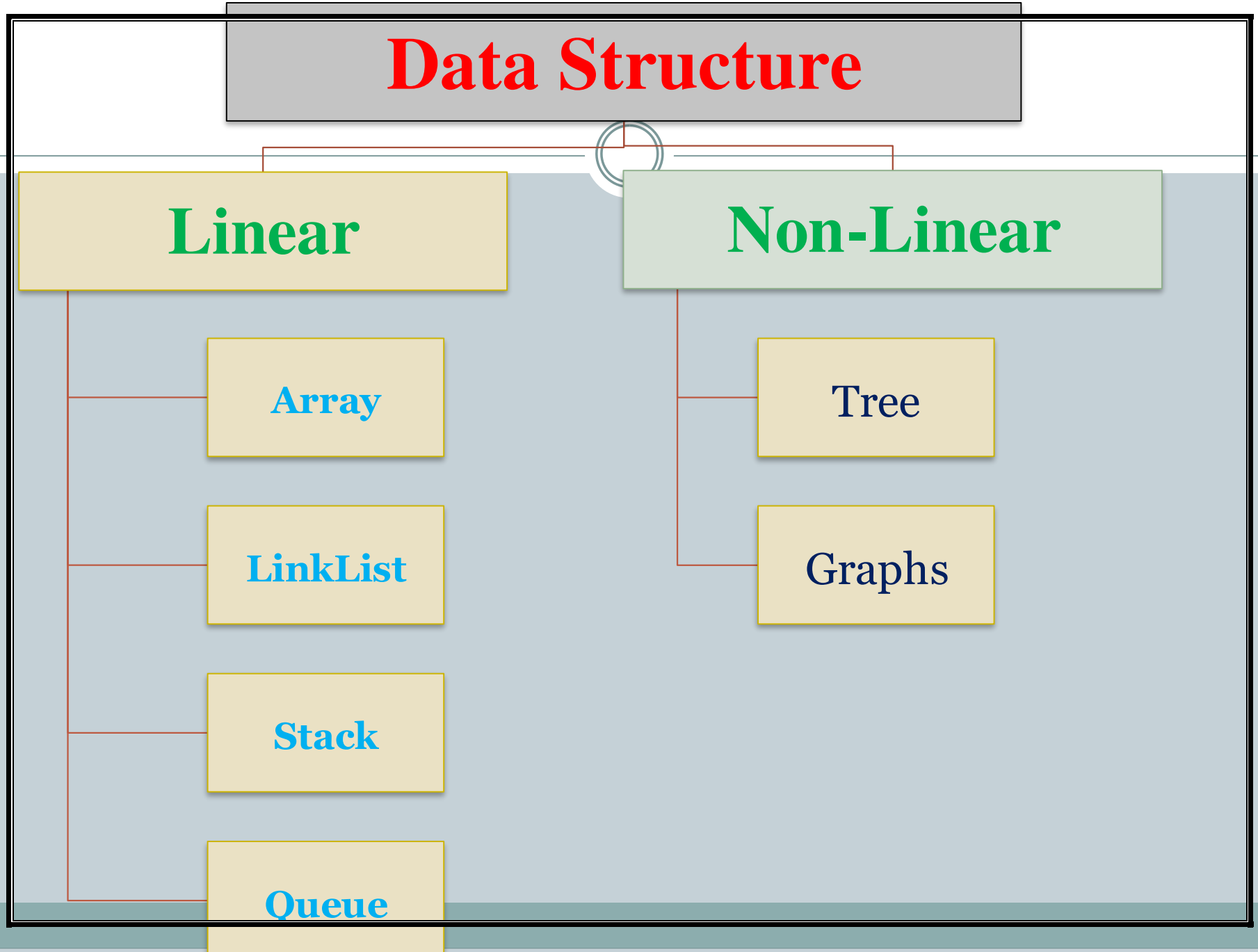
- Classification of Data Structure
- Data Structure Operations

DATA STRUCTURE

A data structure is a class of data that can be characterized by its organization and the operations that are defined on it.

Data Structure = Organized Data + Allowed Operations

In other words, the organized collection of data is called data structure. A Data structure is a set of values along with the set of operations permitted on them.


Data Structure
Linear
Non-Linear
Array
LinkList
Stack
Queue
Tree
Graphs

Classification of Data Structure

There are various ways to classify data structure :

- **Primitive and Non-Primitive Data Structure**
- **Linear and Non-Linear Data Structure**
- **Homogenous and Non-Homogeneous Data Structure**

- **Static and Dynamic Data Structure**

Primitive and Non-Primitive Data Structure

- The data structure that are atomic (indivisible) are called *primitive*.
  - Example are integer, real, Boolean and characters.

- The data structure that are not atomic are called *non-primitive* or composite.
  - Example are records, array and string.

Linear and Non- Linear Data Structure

In a linear data structure, the data items are arranged in a linear *sequence*.

Example is array.

In a non-Linear data structure, the data items *are not in a sequence.*

Example is tree.

Homogeneous and Non- Homogenous Data Structure

- In Homogeneous Structure, *all the elements are of same type.*

  Example is arrays.

- In Non-homogeneous structure, the elements may or *may not be of same type.*

  - Example is records.

Static and Dynamic Data Structure

- Static structures are ones whose sizes and structures, associated memory location are *fixed at compile time*.

- Dynamic structures are ones which *expand(big) or decrease(small)* as required during the program execution and there associated memory location change.

Data Structure Operations

There are six basic operations that can be performed on data structure:-

a) Traversing

b) Searching

c) Sorting

d) Inserting

e) Deleting

f) Merging

(a) Traversing

Traversing means accessing and processing each element in the data structure exactly once.

This operation is used for *counting the number of elements, printing the contents of the elements* etc.

b) Searching

Searching is *finding* out the location of a given element from a set of numbers.

c) Sorting

Sorting is the process of arranging a list of elements in a *sequential order.*

The sequential order may be descending order or an ascending order according to the requirements of the data structure.

(d) Inserting

Inserting an element is *adding an element* in the data structure at any position. After insert operation the number of elements are increased by one.

e) Deleting

Deleting an element is *removing an element* in the data structure at any position. After deletion operation the number of elements are decreased by one.

(f) Merging

The process of *combining the elements of two data structures* into a single data structure is called merging.


THANKS