Introduction to Data Structure

In computer terms, a data structure is a specific way to store and organize data in a computer's memory so that these data can be used efficiently later. Data may be arranged in many different ways such as the logical or mathematical model for a particular organization of data is termed as Data Structure.

The variety of a particular data model depends on the two factor:-

Firstly, it must be loaded enough in structure to reflect the actual relationship of the data with the real world object.

Secondly, the formation should be simple enough so that anyone can efficiently process the data each time it is necessary.

Categories of Data Structure :-

The data structure can be sub divided into major types:

- Linear Data Structure
- Non-Linear Data Structure

Linear Data Structure:

A data structure is said to be linear if its elements combine to form any specific order.

There are basically two techniques of representing such linear structure in memory.

- First way is to provide the linear relationship among all the elements represented by means of linear memory location. These linear structure are termed as Arrays.
- The second technique is to provide the linear relationship among all the elements represented by using the concept of pointers or links. These linear structures are termed as Linked Lists.

The common example of linear data structure are:

- Arrays
- Queues
- Stack
- Linked List

Non-Linear Data Structure :

This Structure is mostly used for representing data that contains a hierarchical relationship among various elements.

Example of Non-Linear Data Structure are listed below :

Notes By Rudra Rana

- Graphs
- Family of Trees
- Tabe of contents

Tree:

In this case, data often contains a hierarchical relationship among various elements. The data structure that reflects this relationship is termed as rooted tree graph or a tree.

Graph:

In this case, data sometimes hold a relationship between the pair of elements which is not necessarily following the hierarchical structure. Such data structure is termed as Graph.

Array:

Array is a container which holds a fix number or items and these items should be of same type. Most of the data structures make use of arrays to implement their algorithms. Following are the important terms to understand the concept of array:

- Element – Each item stored in an array is called an element.
- Index – Each location of an element in an array has a numerical index, which is used to identify the element.

Notes By Rudra Rana