**CONCEPT OF DATA STRUCTURES**

Digital computer can manipulate only primitive data, that is, data in terms of 0's and 1's.Manipulation of primitive data is inherent within the computer and need not require any extra effort from the user side. But in our real life applications, various kind of data other than the primitive data are involved. Manipulation of real-life data (can also be termed as user data) requires lhe following essential tasks:

1. Storage representation of user data: user data should be stored in such a way that

computer can understand it.

2. Retrieval or stored data: data stored in a computer should be retrieved in such a way that user can understand it.

3. Transformation of user data: various operations which require to be performed on user data so that it can be transformed from one form to another.

Basic theory of computer science deals with the manipulation or various kinds of data, where from the concept of data structures comes. In fact, data structure is the fundamentals in computer science. For a given kind of user data. its structure implies the following:

I. Domain (*D*): This is the range of values that the data may have. This domain is also

termed as data object.

2. Function (F): This is the set of operations which may legally be applied to elements

of data object. This implies that for a data structure we must specify the sci of operations.

3. Axioms (A): This is the set of rules with which 1hc different operation belongs to F actually can be implemented

Now we can define the term data structure.

A *data structure ,*D is a triplet, that is. 0 = (*D*. F*.* A***)*** where

*D* is a set of data object,

F is a set of functions and

Ais a set of rules to implement the functions.

Let us consider an example.

We know for the integer data type (int) in C programming language the structure includes of the following type:

*D =* (0, ±I, ±2, ±3, ... )

F= (+, -. •, *I,* %)

*A* = (A set or binary arithmetics to perform addition, subtraction, division. multipLication,

and modulo operations.)