SNS COLLEGE OF TECHNOLOGY

Coimbatore-35
An Autonomous Institution

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DEPARTMENT OF AIML

23ITT101-PROGRAMMING IN C AND DATA STRUCTURES

I YEAR - II SEM

UNIT 3 – ARRAYS AND INTRODUCTION TO DATA STRUCTURES

TOPIC 1 – Introduction to Arrays

INTRODUCTION TO ARRAY

- So far we have used only the fundamental data types, namely
  - **char, int, float, double** and variations of int and double.

- Although these types are very useful, they are constrained by the fact that a variable of these types can store **only one value** at any given time.

- Therefore, they can be used only to handle **limited amounts** of data.

- In many applications, however, we need to handle a large volume of data in terms of reading, processing and printing.

- To process such large amounts of data, we need a **powerful data type** that would facilitate efficient storing, accessing and manipulation of data items.

- C supports a derived data type known as **array** that can be used for such applications.

INTRODUCTION TO ARRAY

- An array is a fixed-size sequenced collection of elements of the **same data type**.
- It is simply a **grouping of like-type data**.
- In its simplest form, an array can be used to represent a list of numbers, or a list of names.
- Some examples where the concept of an array can be used:
    - List of employees in an organization.
    - List of products and their cost sold by a store.
    - Test scores of a class of students.
    - Etc
- Since an array provides a convenient structure for representing data, it is classified as one of the **data structures** in C.
- Other data structures include structures, **lists, Stacks, queues and trees**.

INTRODUCTION TO ARRAY

➢An array is a **sequenced collection** of related data items that share a common name.

➢For instance, we can use an array name **salary** to represent a set of salaries of a group of employees in an organization.

➢We can refer to the individual salaries by writing a number called **index** or **subscript** in brackets after the array name.

➢For example, salary [10] represents the salary of 10th employee.

➢While the complete set of values is referred to as an array, individual values are called **elements**.

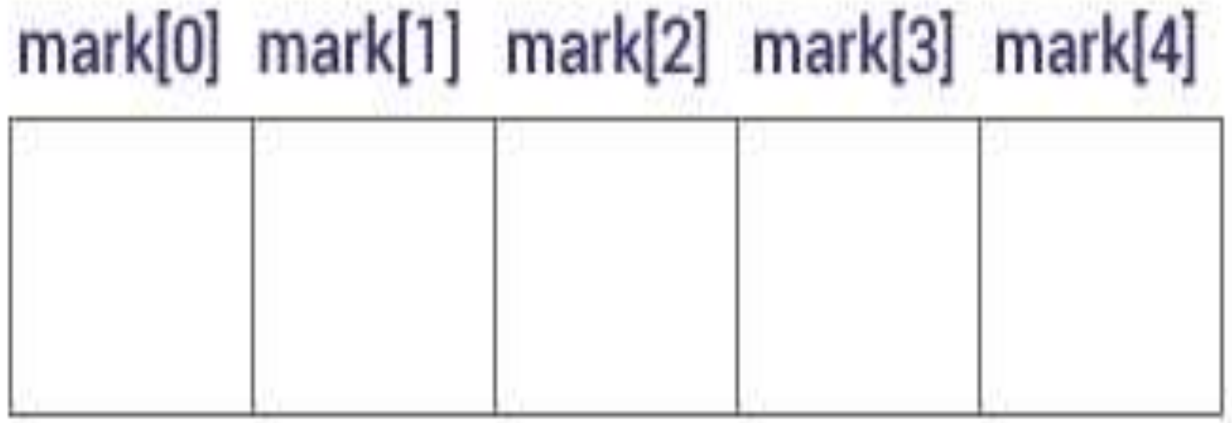
➢The ability to use a single name to represent a collection of items and to refer to an item by specifying the item number enables us to develop concise and efficient programs.

TYPES OF ARRAYS

- We can use arrays to represent not only **simple lists** of values but also **tables of data** in two, three or more **dimensions**.

- There are 3 types of arrays.

- One-dimensional arrays
- Two-dimensional arrays
- Multidimensional arrays



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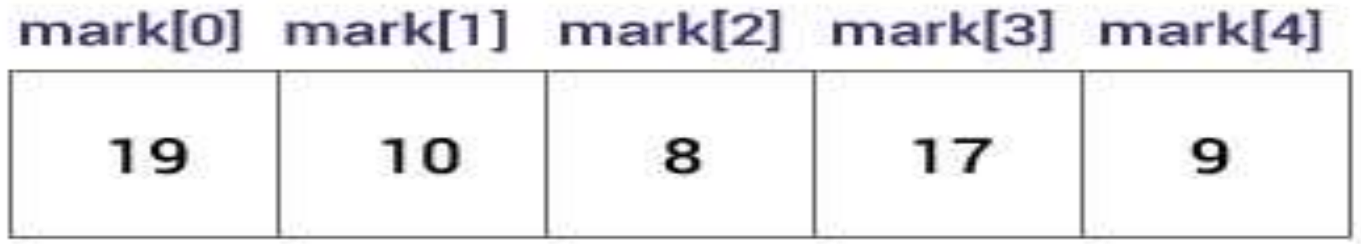

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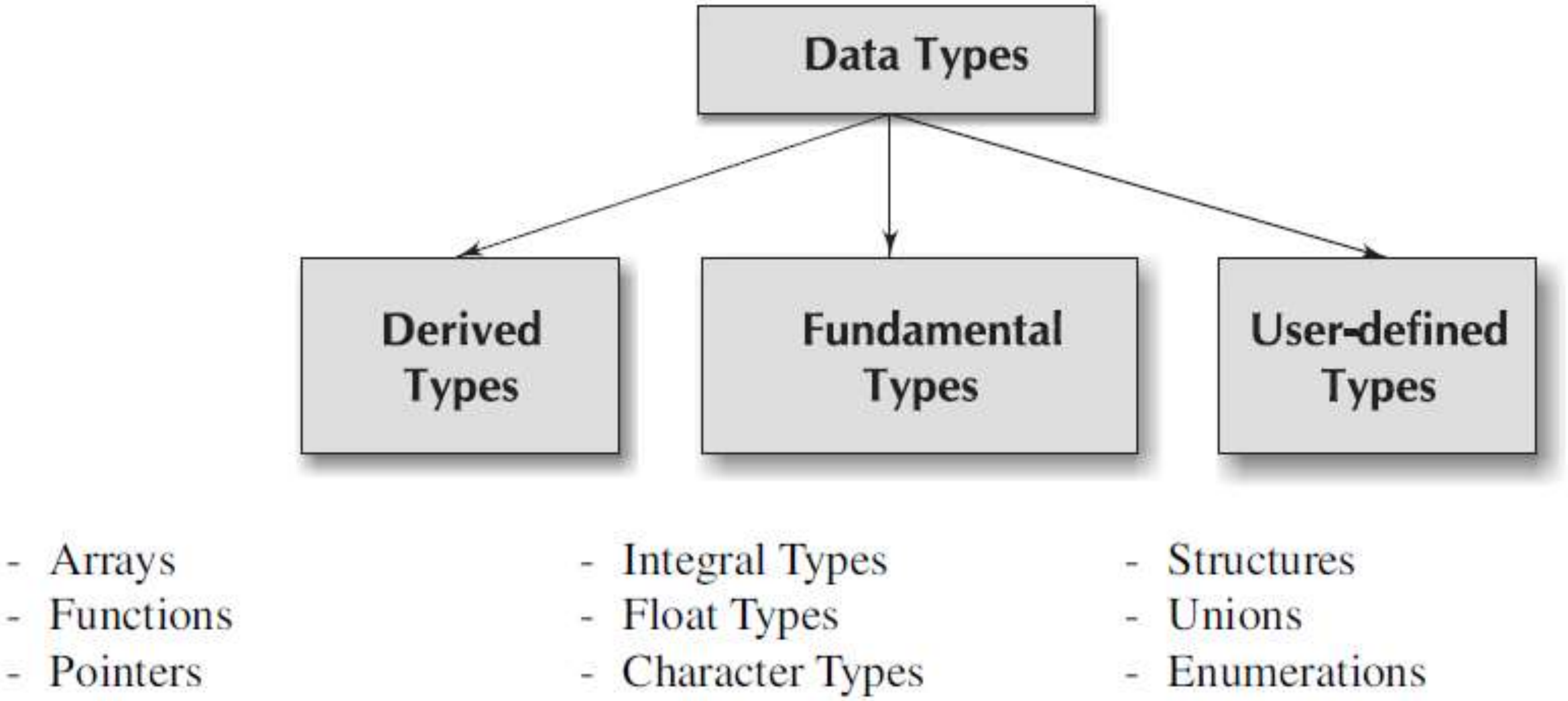
19	10	8	17	9

DATA STRUCTURES

- C supports a rich set of derived and user-defined data types in addition to a variety of fundamental types as shown below:



Data Types

Derived Types
- Arrays
- Functions
- Pointers

Fundamental Types
- Integral Types
- Float Types
- Character Types

User-defined Types
- Structures
- Unions
- Enumerations

- Arrays and structures are referred to as structured data types because they can be used to represent data values that have a structure of some sort.
- **Data Structures** are those with structured data types providing an organizational scheme that shows the relationships among the individual elements and facilitate efficient data manipulations.