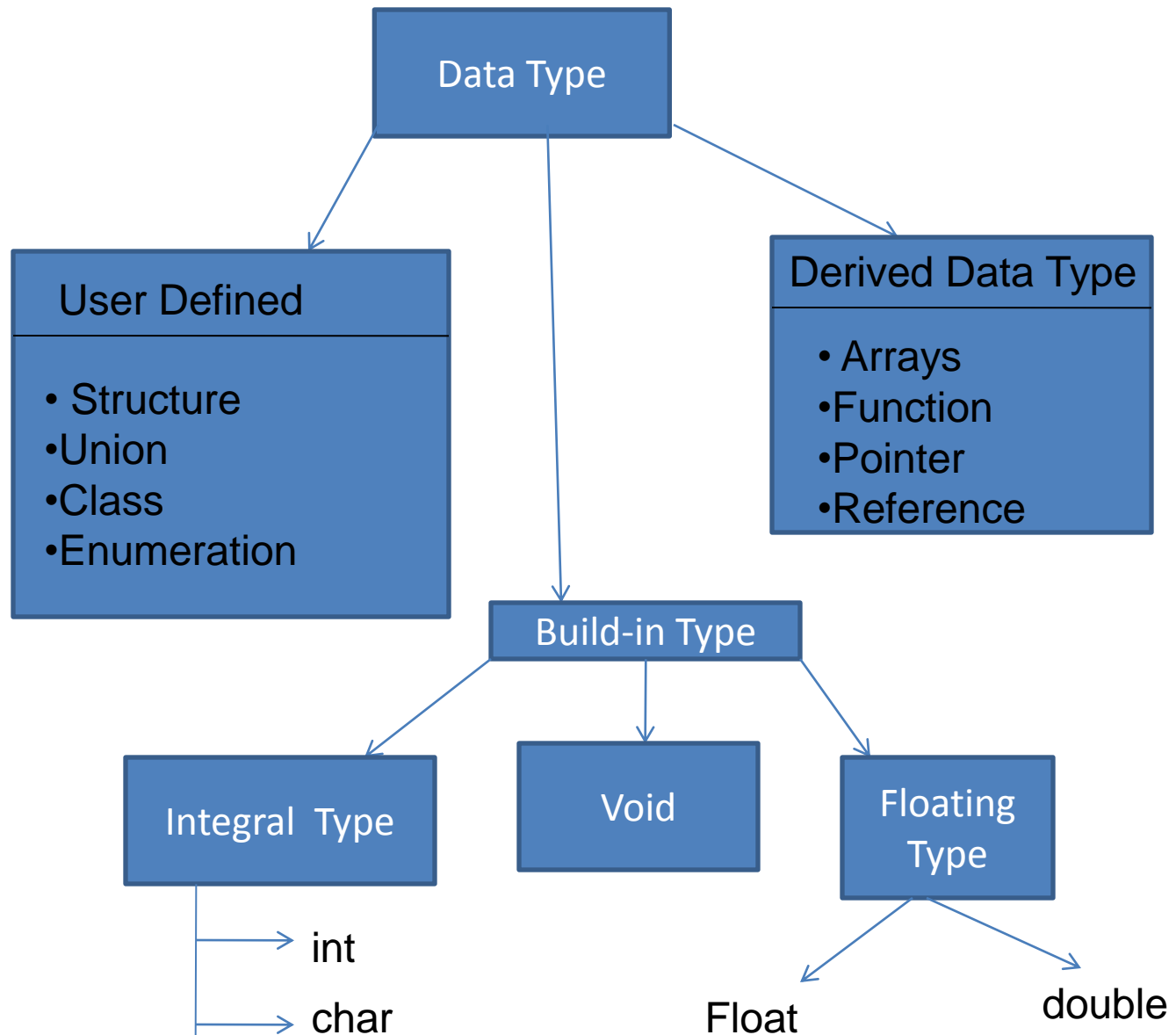


Subprograms and Programmer Defined Data Type

Unit 3

1. Evolution of Data Type
2. Abstract Data Type

Evolution of Data Type



Definition

Function:

If a subprogram returns a single value as a result is known as function .

Procedure:

When a subprogram returns a more than one values is known as procedure or subroutine

Information Hiding

Information hiding is the term that is used for the central principle in the design of programmer defined abstraction. Each such program component should hide as much as possible from users. For example language provide some inbuilt mathematical function and user will just call it without knowing about internal coding. like square –root function

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Types of Abstraction:

- Function Abstraction
- Data Abstraction

The main difference b/w both is that Functional abstraction is refers to a function that can be used without taking in to account how the function is implemented. where as Data abstraction refers to the data that can be used without taking in to account how data are stored.

Reasons for Abstraction are required:

- Flexibility in approach
- Enhance Security
- Easier Replacement
- Modular Approach

Abstraction :

Hiding the complexity of the program is called abstraction and it is implemented with the help of “Encapsulation”

Difference b/w Abstraction & Encapsulation:

Encapsulation:

Is a process of combining the data and function in to a single unit called class .Using this method of encapsulation , the programmer can't directly access the data. Data can only access by function present inside the class .Data Encapsulation led to the important concept of Data Hiding. This method have certain advantages:

- It will reduces the human errors

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In fact the encapsulated objects acts as a **black box** for others part of the program.

- The program is more secure as programmer just interact externally.

Features and Advantages of Encapsulation:

1. Makes Maintenance of Application Easier
2. Improves User Understandability of the Application
3. Enhance Security

Abstraction:

The main idea behind data abstraction is to give a clear separation between properties of data type and associated details. Thus abstraction forms the basic platform for the creation of user defined data types called objects

Abstract Data Type:

Early language like Fortran or Cobol limit the creation of new data type but new language provides the better facility for specifying and implementing entire abstract data type like C++ ,Java classes etc.

Data Abstraction:

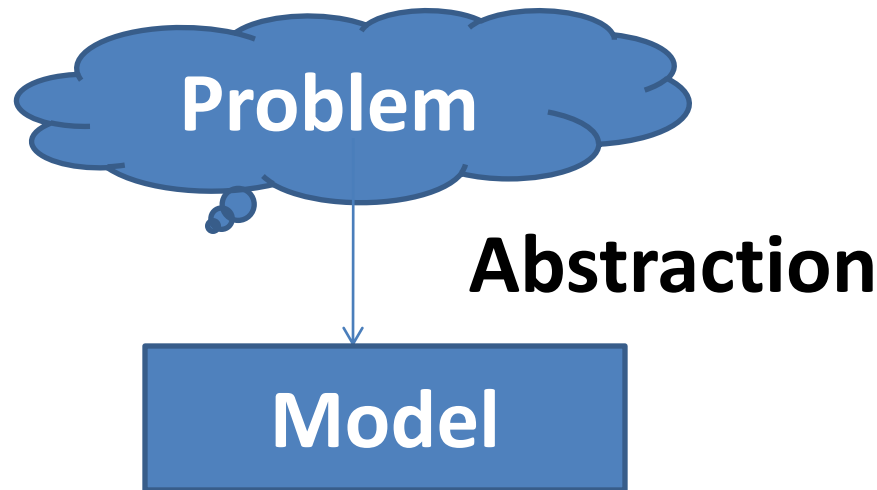
We can define it as :

1. A set of data objects , using one or more data types
2. A set of abstract operation on those data type
3. Encapsulation of the whole in such way that new type can't manipulate data objects of the

Rather than its operation only. Entire definition should be encapsulated in such a way that the user of the just need to know about the

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type name and semantics of available operation.



The model defines an abstract view to the problem. This implies that the model focuses only on the problem related stuff on that u try to define the properties of the problem.

This properties includes:

- ✓The data which are affected
- ✓The operations which are identified by the problem

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To sum-up abstraction is structuring of a problem in to well-defined entities by defining their data operation. An entity with the properties just described is called abstract data type(ADT)

