Data Object

**DEF 1:** A Data Object represents a container for data values, a place where data values may be stored and later retrieved.

**DEF 2:** A runtime grouping of one or more pieces of data in a virtual computer.

**DEF 3:** A location in memory with an assigned name in the actual computer.

**DATA OBJECTS CAN BE**

- **At Program Execution**
  - Programmers-Defined
    - Eg., Variables, Constants, Arrays, files, etc.
  - System Defined
    - Runtime: Storage, Stacks, file buffers, free space, etc.

- **Data Values**
  - Can be
    - Single Numbers
    - Pointers to other objects
    - Characters
A Data Object is usually represented as storage in computer memory and a data value is represented by a pattern of bits.

So we can represent the relation between Data Object and Data Value.

A: [Blank] 10001 A: [Blank]

(a) Data Object: A location in computer memory with the name A.
(b) Data Value: A bit pattern used by the translator whenever the no. 17 is used in a program.
(c) Bound Variable: Data Object bound to data value 17.

A simple variable Data Object with Value 17.

A data Object is Elementary if it contains a data value that is always manipulated as a unit.

A data object is a data structure if it is an aggregate of the data objects.

Binding & Attributes of Data Object: Binding is an association of Data Values & entity.

Type: This associates the data object with the set of data values that the object may take.
2) **Location**: This associates the binding of a storage location in memory where the data object is represented. Only storage management routines can change the data object in the virtual computer.

3) **Value**: This binding is usually the result of an assignment operation.

4) **Name**: The binding to one or more names by which the object may be referenced during program execution is usually setup by declaration and modified by subprogram calls and returns.

6) **Component**: The binding of a data object to one or more data objects of which it is a component is often represented by a pointer value. And may be modified by a change in pointer.

![Diagram](image.png)

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