

- \* Don't model the real world very well.
- \* Not usually extensible.
- \* Globalization of data leads to loss of important information.
- \* Follows Structural programming approach.
- \* The approach being function-oriented, data is given least importance.
- \* Modification & addition of new functions are difficult.

## Object-Oriented Programming

The major motivating factor in the invention of Object-Oriented approach is to remove some of the flaws encountered in Procedural approach.

- \* OOP treats data as a critical element in the program development & does not allow it to flow freely around the system.
- \* OOP allows decomposition of a problem into a no. of entities called objects & then builds data & functions around these



objects. OR. OOP approach binds data & functions that operate on that data into a single entity. Such an entity is called an object.

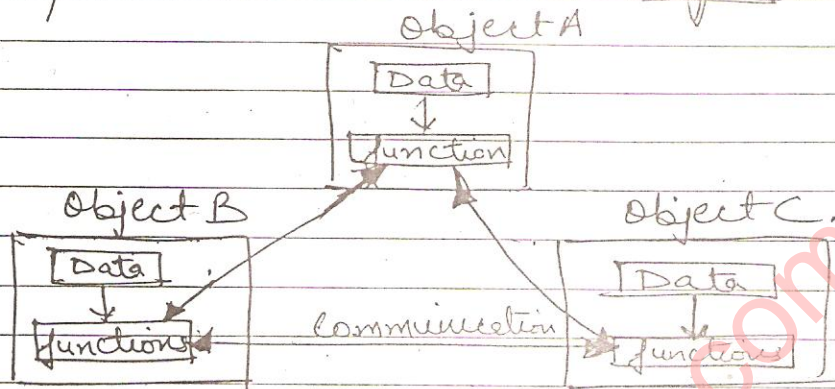


Fig:- Organization of data & functions

Objects are independent of each other. They are responsible for their own state & offering services to other objects. ∴ new objects can be easily added whenever necessary.

∴ Thus, we define "OOP as an approach that provides a way of modularizing programs by creating partitioned memory area for both data & functions that can be used as templates for creating copies of such modules on demand."

Striking features of object-oriented programming:

- \* Emphasis is on data rather than procedure.
- \* Programs are divided into what are known as objects.

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- \* Data structures are designed such that they characterize the objects.
- \* Functions that operate on data of an object are tied together in the data structure.
- \* Data is hidden and cannot be accessed by external functions.
- \* Objects may communicate with each other through functions.
- \* New data & functions can be easily added whenever necessary. (Extensible).
- \* Follows bottom-up approach in program design.
- \* OOP is more data-oriented.
- \* Data security exists.
- \* Addition of new data & function (i.e. object) is easy.
- \* Programs are made up of objects which model real-world entities.
- \* Objects communicate through functions.
- \* Extensible.

### Object - Oriented Languages

Implementation of OOP concept need a language to support them. Accordingly, they have been classified as follows:-



- \* Object Based Programming Languages (OBPL)
- \* Object Oriented Programming Languages (OOPL)

Features supported by OBPL	Features supported by OOPL
<ul style="list-style-type: none"> <li>◦ Data Encapsulation</li> <li>◦ Constructors</li> <li>◦ Destructors</li> <li>◦ Operator overloading</li> </ul> <p>Eg:- Ada language</p>	<ul style="list-style-type: none"> <li>◦ Data Encapsulation</li> <li>◦ Constructors</li> <li>◦ Destructors</li> <li>◦ Operator Overloading</li> <li>◦ Inheritance</li> <li>◦ Dynamic Binding</li> </ul> <p>Eg:- C++, Smalltalk.</p>

### Application of OOP

Most famous application of OOP is User Interface Design eg windows

Other application areas are:-

- \* Real-Time System
- \* Neural network
- \* Object Oriented Databases
- \* AI & Expert System
- \* CAD/CAM System
- \* Object Oriented databases
- \* Office Automation System

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