OBJECT ORIENTED PROGRAMMING

(OOP)

WHAT IS OOP ?

- OOP Stand for Object Oriented Programming Language
- The Main purpose of OOP is to deal with real world entity using programming Language.
- OOP used in C Language , C++ , C# , Java , etc.
- OOPS Features :
  - **Objects**
  - **Class**
  - **Inheritance**
  - **Polymorphism**
  - **Encapsulation**
  - **Abstraction**

Objects

- An objects represents an individual, identifiable item, unit, or entity, either real or abstract with a well-defined role in the problem domain.
- That is both data and function that operate on data are bundled as a unit called as object.
- Object = data + methods
- Any entity which has own state and behavior
- Ex:
  - **Pen**
  - **Paper**

Class

- blueprint for an object.
- A class represents an abstraction of the object and abstracts the properties and behavior of that object.
- An object is a particular instance of a class which has actual existence and there can be many objects (or instances) for a class.
- Collection of objects
- Ex :
  - **Animal body**
  - **Human body**

Inheritance

- Inheritance means that one class inherits the characteristics of another class. This is also called a “is a” relationship
- This is a very important concept of object-oriented programming since this feature helps to reduce the code size.
- When one object acquire all the properties and behavior of parent class
- Ex :
  - **father-son**
  - **Teacher-student**

Polymorphism

- Polymorphism means “having many forms”.
- It allows different objects to respond to the same message in different ways, the response specific to the type of the object.
- The most important aspect of an object is its behavior (the things it can do). A behavior is initiated by sending a message to the object (usually by calling a method).
- Many ways to perform anything
- Ex :
  - **Method Overloading**
  - **Method Overriding**

Encapsulation

- Encapsulation is the practice of including in an object everything it needs hidden from other objects.
- The internal state is usually not accessible by other objects.
- Wrapping up of data or binding of data
- Ex :
  - **Capsule**
  - **Ram**

Abstraction

- Abstraction is the representation of the essential features of an object. These are ‘encapsulated’ into an abstract data type.
- a database system hides certain details of how data is stored and created and maintained.
- Hiding internal details and showing funcitonalities
- Ex :
  - **login page**
  - **Login password**