Unit – 03: Apply Object Oriented Concepts in PHP

- Creating Classes and Objects,
- Constructor and Destructor,
- Inheritance,
- Overloading and Overriding,
- Cloning Object, Introspection, Serialization.

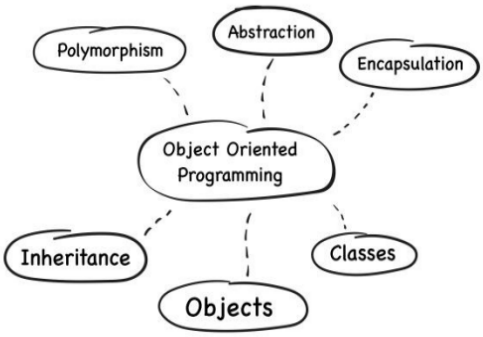
Questions to be discussed:

1. Explain Object-Oriented Programming concept in PHP.
2. Define object and class in PHP and also write its syntax.
3. What is constructor in PHP? How it differs from destructor.
4. Define inheritance in PHP. Also discuss its type in brief.
5. Differentiate between function overloading and function overriding in PHP.
6. Write short notes on:
   a. Cloning object.
   b. Introspection & serialization.

Object-Oriented Programming concept in PHP:

- OOP stands for Object Oriented Programming.
- It is a method to design a program using classes and objects.
- Alan Kay coined the term "object oriented programming" in 1966.
- OOP in PHP allow to a programming style having an association of the class and objects.
- Object-oriented programming in PHP helps developers build reusable and complex web applications.

1. Object
2. Class
3. Inheritance
4. Polymorphism
5. Abstraction
6. Encapsulation



Objects

- Any entity that has state and behavior is known as an object.
- An object is an instance of class.
- For example: a chair, pen, table, keyboard, bike, etc.

Example:

Class: Human	**Object:** Man, Woman
Class: Fruit	**Object:** Apple, Banana, Mango, Guava etc.
Class: Mobile phone	**Object:** iPhone, Samsung, Moto, Nokia etc.
Class: Food	**Object:** Pizza, Burger, Samosa

Class

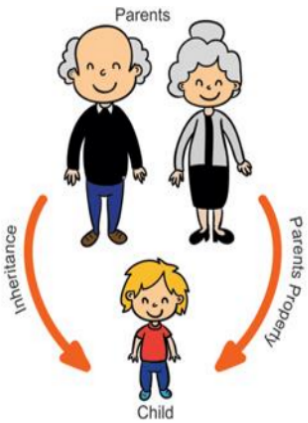
- Collection of similar types of objects is called class.
- Class is a user-defined data-type.
- Example: Fruits, Human, Mobile Phone, Food etc.

Inheritance

- When one object acquires all the properties and behaviors of a parent object, it is known as inheritance.

Polymorphism

- Existing in multiple forms.
- If one task is performed by different ways, it is known as polymorphism.



Abstraction

- Hiding internal details and showing functionality is known as abstraction.
- For example: phone call, we don't know the internal processing.

Encapsulation

- Binding (or wrapping) code and data together into a single unit are known as encapsulation.
- For example: capsule, it is wrapped with different medicines.

Creating an object in PHP:

- The distinct items in a class are known as **objects**.
- An objects are also known as instance of class.
- To create an object in PHP, you must use the **new** keyword.

Syntax:

```
$object_name = new class_name;
```

Example:

```
$php = new books;
$DBMS = new books;
```

Creating class in PHP:

- Classes are the blueprints of objects.
- Class is a user-defined data type which includes local methods and local variables.
- Class is a collection of similar types of objects.
- A class is defined by using the **class** keyword, followed by the name of class & pair of curly braces ({}).
- All its properties and methods go inside the braces:

Syntax:

```
<?php
    Class Books
    {
        ..............
        ..............
    }
?>
```

Example:

```
<?php
    class Books
    {
        // Members of class Books
    }
?>
```

What is constructor in PHP?

- A constructor is a special member function of a class which initializes objects of a class.
- In PHP, Constructors are automatically called when the object are created.
- Constructor has same name as the class name and don't have return type.
- A constructor allows you to initialize an object's properties upon creation of the object.
- If you create a __construct() function, PHP will automatically call this function when you create an object from a class.
- Notice that the construct function starts with two underscores (_ _).

Syntax:

```
function __construct( )
{
        // initialize the object and its properties by assigning
        //values
}
```

There are three types of constructor in PHP:

Default Constructor:

- It has no parameters, but the values to the default constructor can be passed dynamically.

Parameterized Constructor:

- It takes the parameters, and also you can pass different values to the data members.

Copy Constructor:

- It accepts the address of the other objects as a parameter.

What is destructor?

- Destructor is a special class function which destroys the object as soon as the scope of object ends.
- Destructors are used for destroying objects and automatically called at the end of execution.
- A destructor is called when the object is destructed or the script is stopped.
- If you create a _ _destruct( ) function, PHP will automatically call this function at the end of the script.
- Notice that the destruct function starts with two underscores (_ _)

Syntax:

```
function _ _destruct( )
{
        // destroying the object or clean up resources here
}
```

What is Inheritance in PHP?

- Inheritance in OOP = When a class derives from another class.
- The child class will inherit all the public and protected properties and methods from the parent class.
- An inherited class is defined by using the **extends** keyword.
- Inheritance has three types, single, multiple and multilevel Inheritance.
- **PHP** supports only **single inheritance**, where only one class can be derived from single parent class.

Function Overloading in PHP:

- Function overloading is a feature that permits making creating several methods with a similar name.
- That works differently from one another in the type of the input parameters it accepts as arguments.
- Function Overloading is the process of assigning two or more function with the same name, but different in parameters.
- The advantage of Function overloading is that it increases the readability of the program.

Function Overriding in PHP:

- In function overriding, the parent & child classes have the same function name and arguments
- It is used to replace the parent method in child class.
- The purpose of function overriding is to change the behavior of the parent class method.
- The two functions with the same name and the same parameter are called function overriding.

Difference between function overloading and function overriding:

Function Overloading	Function Overriding
Function Overloading provides multiple definitions of the function by changing signature.	It redefinition of base class function in its derived class with same signature.
An example of compile time polymorphism.	An example of run time polymorphism.
It is used when the same function has to behave differently depending upon parameters passed.	It is needed when derived class function has to do some different job than the base class function.
A function has the ability to load multiple times.	A function can be overridden only a single time.
In this, we don't need inheritance.	In function overriding, we need an inheritance.

What is cloning of object in PHP?

- The clone keyword is used to create a copy of an object.
- If any of the properties was a reference to another object, then only the reference is copied.
- Objects are always passed by reference, so if the original object has another object in its properties, the copy will point to the same object.
- This behavior can be changed by creating a __clone( ) method in the class.

Syntax:

```
$copy_of_object = clone $object;
```

What is introspection in PHP?

- Introspection is the ability of a program to examine an object's characteristics.
- It examines the objects name, parent class (if any), properties, and methods.
- With introspection, you can write code that operates on any class or object.
- You don't need to know which methods or properties are defined when you write your code.

What is object serialization in PHP?

- It is the process of converting an object into a string representation that can be stored or transmitted.
- The serialize( ) function converts a storable representation of a value.
- To serialize data means to convert a value to a sequence of bits, so that it can be stored in a file, a memory buffer, or transmitted across a network.
- This function only available in PHP version 4.0 or above.

Syntax:

```
serialize(value);
```