Apply Object Oriented Concepts in PHP

Unit - III

3.1 Creating Classes and Objects

- Class:
  - ✓A class is defined by using the *class* keyword, followed by the name of the class and a pair of curly braces.

  Syntax:

```
class class_name
{
        //properties;
        //methods( );
}
```

3.1 Creating Classes and Objects

- Object:
  - ✓Objects of a class is created using *new* keyword. Each object has properties and methods defined in the class.

  Syntax:

  $object_name = new class_name();

3.1 Creating Classes and Objects

- Object:

```
<html> <body>
<?php class student {
  public $name;
  function set_name($n) {
        $this->name = $n; }
  function get_name() {
        return $this->name;
  }}
$stud1 = new student();
$stud1->set_name('Zaid');
echo $stud1->get_name();
?></body></html>
```

Output:

Zaid

3.1 Creating Classes and Objects

- Access Modifiers:
  - ✓There are 3 access modifiers in PHP.

    - ❑Public: Property and method can be accessed from everywhere. It is default.
    - ❑Protected: Property and method can be accessed within the class and child class.
    - ❑Private: Property and method can be accessed within the class only.

3.2 Constructor & Destructor

- Constructor:

✓Constructor allows you to initialize an object's properties upon creation of the object.

✓In PHP, a constructor function name is _construct(). It starts with an underscore (_).

✓PHP will automatically call constructor when an object for a class is created.

3.2 Constructor & Destructor

- Constructor:

```
<html> <body> <?php
class student {
  public $name;
  function __construct($n) {
    $this->name = $n; }

  function get_name() {
    return $this->name; }}
$stud = new student("Zaid");
echo $stud->get_name();
?>
</body></html>
```

Output:

Zaid

3.2 Constructor & Destructor

- Destructor:

✓Destructor is called when the object is destroyed or the script is stopped or exited.

✓In PHP, destructor function name is __destruct( ). Function name start to two underscore (__).

✓PHP automatically call this function at the end of the script.

3.2 Constructor & Destructor

- Destructor:

```
<?php
class Fruit {
  public $name;
  public $color;
  function __construct($name) {
    $this->name = $name;   }
  function __destruct() {
    echo "The fruit is {$this->name}.";  }}
$apple = new Fruit("Apple");
?>
```

Output:

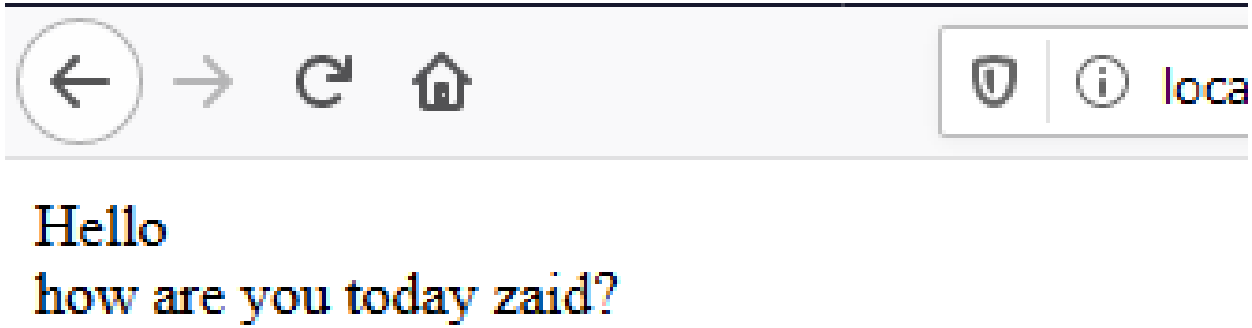
The fruit is Apple.

3.3 Inheritance

- When a class is derived from another class, it known as inheritance.
- The child class will inherit all the public and protected properties and methods of parent class.
- In addition, it can have its own properties and methods.
- An inherited class is defined by *extends* keyword.
- Final keyword can be used to prevent a class inheritance or to prevent method overriding.

3.3 Inheritance

```
<?php
class person
 {
  public $name;
  public function __construct($n) {
    $this->name = $n; }
  public function intro() {
    echo "Hello "; } }
class Age extends person {
     public function message() {echo "<br> how are you today ".$this-
  >name."?"; } }
$a = new Age("zaid");
$a->intro();
$a->message(); ?>
```



3.3 Inheritance

- Abstract Class:
  - An abstract class is a class that contains at least one abstract method.
  - An abstract method is a method that is declared but not implemented in the class.
  - Abstract classes and methods are when the parent class has a named method, but need its child class(es) to fill out the tasks.
  - An abstract class or method is defined with the *abstract* keyword:

3.3 Inheritance

```
<?php
abstract class student {      // Parent class
  public $name;
  public function __construct($name) {
    $this->name = $name; }
  abstract public function intro() : string;
}
class computer extends student {// Child classes
  public function intro() : string {
return "Hello.. This is $this->name, i am from computer department";  }}

$stud = new computer("Zaid");
echo $stud->intro();
?>
```

Output:

Hello.. This is Zaid, i am from computer department

3.3 Inheritance

- Static Methods:
  - Static methods can be called directly – without creating an instance of a class.
  - Static methods are declared with the keyword *static*.
  - To access a static method use *class_name*, double semi colon(::) and method name.

    class_name :: static_method_name( );
  - A class can have both static and non static methods.
  - A static method can be accessed from a method in the same class using the keyword *self* and double semi colon (::)

    self::static_method_name( );
  - To call a static method from a child class, use the *parent* keyword inside child class. parent::static_method_name( );

3.3 Inheritance

- Static Methods:

```
<?php
class greeting {
  public static function welcome() {
    echo "Hello World!";
  }
}

// Call static method
greeting::welcome();
?>
```

Output:

Hello World!

3.3 Inheritance

- Static Methods:

```
<?php
class greeting {
  public static function welcome() {
        echo "Hello World!";
  }
  public function __construct() {
        self::welcome();
  }
}
new greeting();
?>
```

Output:

Hello World!

3.3 Inheritance

- Static Methods:

```
<?php
class domain {
  protected static function getWebsiteName() {
        return www.MHSSP.in; }
}
class domainW3 extends domain {
  public $websiteName;
  public function __construct() {
        $this -> websiteName = parent::getWebsiteName();}
}
$domainW3 = new domainW3;
echo $domainW3 -> websiteName;
?>
```

Output:

www.MHSSP.in

3.3 Inheritance

- Static Properties:
  - Static properties can be called directly – without creating an instance of a class.
  - Static properties are declared with the keyword *static*.
  - To access a static property use *class_name*, double semi colon(::) and *property name.*

    class_name :: static_ property_name;

  - A class can have both static and non static properties.
  - A static property can be accessed from a method in the same class using the keyword *self* and double semi colon (::)

    self::static_ property _name;

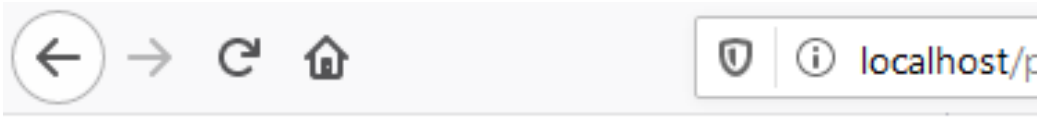
  - To call a static property from a child class, use the *parent* keyword inside child class. parent::static_ property _name);

3.3 Method Overloading

- In PHP, we can perform method overloading with the help of magic function _call().
- The _call() function accepts two arguments: function_name & argument (array).
- _call() is automatically invoked whenever a function call is given with function_name mentioned above.

3.3 Method Overloading

```
class shape {
    function __call($name_of_function, $arguments) {
        if($name_of_function == 'area') {
            switch (count($arguments)) {
                case 1: return 3.14 * $arguments[0];
                case 2: return $arguments[0]*$arguments[1];
            } }
    } }
$s = new Shape;
echo("Area of Circle: ".$s->area(2));
echo "<br>";
echo ("Area of rectangle: ".$s->area(4, 2));
```



Area of Circle: 6.28
Area of rectangle: 8

3.3 Method Overriding

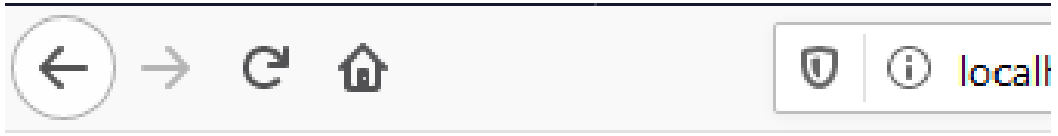
- When a function is implemented in child class with same name & signature as that of its parent class, then the function in parent class is said to be overridden by the child class.

- This process is known as function/method overriding.

3.3 Method Overriding

```
<?php
class A
{ public function show()
  {    echo "<br>Inside Parent class";} }
class B extends A
{ public function show()
  {    echo "<br>Inside Child class"; } }

$a=new A();
$b=new B();
$a->show();
$b->show();
?>
```



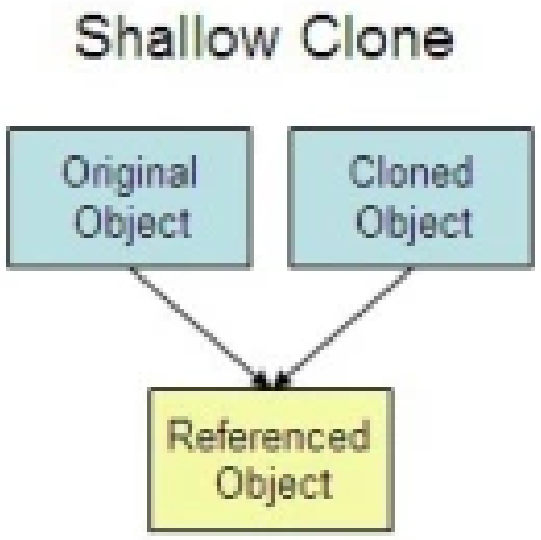
Inside Parent class
Inside Child class

3.3 Final Keyword

- The *final* keyword is used only for methods and classes.
- If we define a method with final, then it prevent us from overriding the method.
- If final keyword is used with class, then it prevents the class from being inherited.

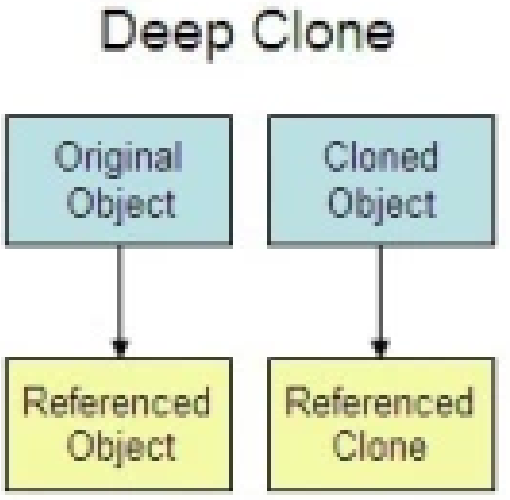
3.3 Object Cloning

- Shallow Copy:
  - In the process of shallow copying A, B will copy all of A's field values.
  - If the field value is a memory address it copies the memory address, and if the value is a primitive type it copies the value of the primitive type.
  - But in shallow copy, if you modify the content of B's field you are also modifying what A's field contains.



3.3 Object Cloning

- Deep Copy:
  - In this process, the data is actually copied completely.
  - The advantage is that A and B do not depend on each other.
  - In this method, all the things in object A's memory location get copied to object B's memory location.



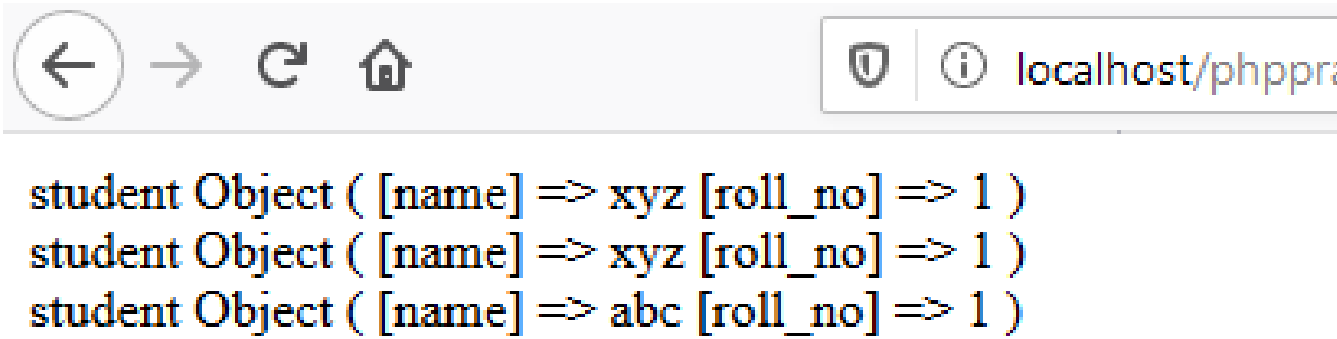
3.3 Object Cloning

- In PHP, when an object is copied using *assignment operator* (=) then a *shallow copy* is performed on the original object.

- To perform a *Deep copy*, *clone* keyword is used.

3.3 Object Cloning

```
<?php
class student
{ public $name;
    public $roll_no;
    function __construct($a,$b)
    {    $this->name=$a;
        $this->roll_no=$b; } }
$stud1=new student("abc",1);
$stud2=$stud1;
$stud3=clone $stud1;
$stud1->name="xyz";
print_r($stud1); echo "<br>";
print_r($stud2); echo "<br>";
print_r($stud3);
?>
```



3.4 Introspection

- Introspection, in PHP, is the ability to examine an object's characteristics, such as its name, parent class properties (if any), classes, interfaces and methods.

- PHP offers large number of functions that one can use to accomplish the task.

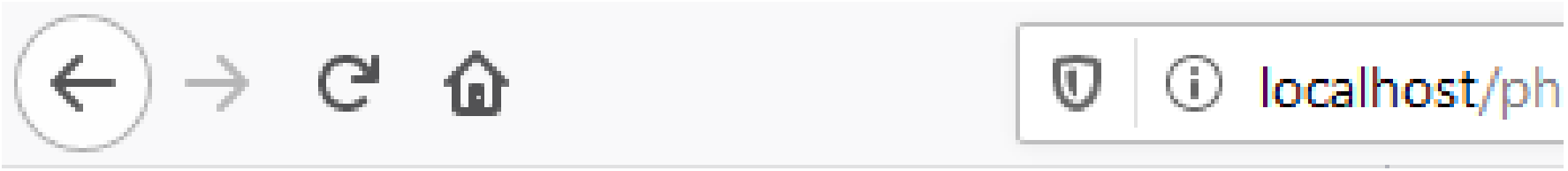
3.4 Introspection

Function Name	Description
class_exists( )	Checks whether a class has been defined.
get_class( )	Returns the class name of an object
get_parent_class( )	Returns the class name of an object's parent class.
is_subclass_of( )	Checks whether an object has a given parent class.
get_declared_classes( )	Returns a list of all declared classes.
get_class_methods( )	Returns the names of the class methods.
get_class_vars( )	Returns the default properties of a class.
interface_exists( )	Checks whether the interface is defined.
method_exists( )	Checks whether an object defined a method.

3.4 Introspection

```
<?php
class Introspection
{    public function description() {
        echo "I am a super class for the
  Child class.<br>";
 }}
class Child extends Introspection
{
    public function description() {
        echo "I'm " . get_class($this) , "
  class.<br>";
        echo "I'm " .
  get_parent_class($this) , "'s child.<br>";
}}
if (class_exists("Introspection")) {
    $introspection = new Introspection();
    echo "The class name is: " .
  get_class($introspection) . "<br>";
    $introspection->description();}
if (class_exists("Child")) {
    $child = new Child();
    $child->description();
    if (is_subclass_of($child,
  "Introspection")) {
        echo "Yes, " . get_class($child) . " is
  a subclass of Introspection.<br>";
    }
    else {
        echo "No, " . get_class($child) . " is
  not a subclass of Introspection.<br>";
    }
?>
```

3.4 Introspection



The class name is: Introspection
I am a super class for the Child class.
I'm Child class.
I'm Introspection's child.
Yes, Child is a subclass of Introspection.

3.4 Serialization

- It is a technique used by programmers to preserve their working data in a format that can later be restored to its previous form.
- Serializing an object means converting it to a bytestream representation that can be stored in a file.
- This is useful for persistent data; for example, PHP sessions automatically save and restore objects.

3.4 Serialization

- Serialize( ):
  - It converts a storable representation of a value.
  - It accepts a single parameter which is the data we want to serialize and returns a serialized string.
  - A serialize data means a sequence of bits so that it can be stored in a file, a memory buffer or transmitted across a network link.

Syntax:

```
serialize(value);
```

3.4 Serialization

- Unserialize( ):
  - It is used to create the original variable values.
  - i.e. converts actual data from serialized data.

Syntax:

```
unserialize(serialized_string);
```

3.4 Serialization

```
<?php
  $s=serialize(array('Welcome','to','PHP'));
  print_r($s."<br>");
  $us=unserialize($s);
  print_r($us);
?>
```