

Web Development II



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PHP Object Oriented Classes and objects

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Introduction

- <http://www.php.net/manual/en/language.oop.php>
- <http://www.php.net/manual/en/language.oop5.php>
- PHP offers principal features of OO Paradigm to the programmer:
 - Encapsulation,
 - Simple inheritance,
 - Constructor and destructor methods
 - Member privacy (visibility)
 - Interfaces
 - Overloading
 - Abstraction
 - etc.

Defining classes

- How to declare a class:

```
class myClass
{
    public $attribute1, $attribute2, ...;
    function __Construct($arg1, $arg2, ...) {...}
    function Method1(...) {...}
    function Method2(...) {...}
    ...
}
```

- Class attributes must be declared explicitly depending on its visibility.
 - It is the unique case where an identifier is due to declare.
 - It is possible to use 'var' in order to maintain compatibility with PHP4.
- A class only can have one constructor

Defining objects

- Creating an object
`$myObject = new myClass(...);`
- How to access to class members, operator arrow: -> (hyphen, right angle bracket)
 - Outside the class: `$myObject->attribute/method`
 - Inside the class: `$this->attribute/method`
- Scope resolution operator ::
 - allows access to static, constant, and overridden members or methods of a class.
 - `Self::` allows to access to own static members and methods.
 - `parent::` allows to access to superclass static members and methods.

Constructor & destructor

- Class Constructor and Destructor have its own name:
 - Constructor: `__construct()`
 - Destructor: `__destruct()`
- In previous PHP 5 versions:
 - The constructor was a member method with the same name of its class.
 - There were not class destructors.
- Destructor will be invoked if:
 - All references of an object disappear.
 - An object is explicitly destroyed.

Example

```
<?
class Person
{
    var $name, $surname;

    function __Construct($n, $a)
    {
        $this->name = $n;
        $this->surname = $a;
    }
}

$p1 = new Person('Homer', 'Simpson');
$p2 = new Person('Peter', 'Griffin');

echo "$p1->surname, $p1->name<br />";
echo "$p2->surname, $p2->name<br />";
?>
```

Inheritance

- Simple inheritance can be realised by means of `extends` keyword.
- Simple inheritance means a class can only inherit from just one superclass (or base class)
- ATTENTION: base class constructor is not called automatically from the subclass constructor. You must invoke it explicitly.

- Inheritance syntax:

```
class SubClass extends BaseClass
{
    ...
}
```

- It is possible to overwrite all base class methods, whenever they are not 'final'.
- We can access to base class methods or attributes using:
`parent::`

Constructor & destructor: inheritance

- Child classes do not call base class constructor or destructor automatically
→ They have to be invoked explicitly:
 - `parent::__construct()`
 - `parent::__destruct()`

Inheritance Example

```
<?
...
class Client extends Person
{
    var $code;

    function __Construct($n, $a, $c)
    {
        parent::__Construct($n, $a);
        $this->code = $c;
    }
}

$c1 = new Client('Bender', 'Rodriguez', 123);
echo "$c1->surmane, $c1->name: $c1->code<br />";
?>
```

One more example

```
<?php
class myClass {
    function __construct() {
        print "Parent class Constructor\n";
    }
}

class childClass extends myClass {
    function __construct() {
        parent::__construct();
        print "Child class Constructor\n";
    }
}

$oParent = new myClass();
$oChild = new childClass();
?>
```

Visibility

- The visibility of a property or method can be defined by prefixing the declaration with the keywords: `public`, `protected` or `private`.
- There are three levels of visibility:
 - `public`: Public declared items can be accessed everywhere.
 - `protected`: Protected limits access to inherited and parent classes (and to the class that defines the item).
 - `private`: Private limits visibility only to the class that defines the item.
- Class attributes have to be declared with their visibility.
 - If they are declared with `'var'` they will be `'public'`.
- By default, methods declared without visibility will be `'public'`.

abstract classes and methods

- `abstract` :
 - It is not allowed to create an instance of a class that has been defined as `abstract`
 - Any class that contains at least one abstract method must also be `abstract`.
 - Methods defined as `abstract` simply declare the method's signature they cannot define the implementation.
 - When inheriting from an abstract class, all methods marked `abstract` in the parent's class declaration must be defined by the child

Final and Static

- `final`:
 - A class defined `final` cannot be extended.
 - Prevents child classes from overriding a method by prefixing the definition with `final`.
- `Static`:
 - Todo método estático puede ser invocado sin tener que instanciar un objeto de esa clase.
 - `$This` no está accesible desde un miembro estático.

More OO features

- Interface: allows to specify like a class templates.
- Method overloading: provides means to dynamically "create" members and methods
- Magic methods: You cannot have functions with these names in any of your classes unless you want the magic functionality associated with them.
- Object cloning: Creating a copy of an object with the same data and status.
 - `clone` and `__clone`: special methods.
- Object comparison operator: `===`

Exercises

- Define a class 'cAuthor' with three attributes: name, surname and country.
- Define a class 'cBook' with three attributes: title, number of pages and and object 'cAuthor'.
 - Create all necessary methods: constructor, destructor, gets and sets.
 - Program each class in a single file.
- Code a new PHP script including previous files and declare an object 'cBook' with data and finally print its attribute values.