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Advantages and disadvantages

Disadvantages

- It's an interpreted language (not compiled)
    - Slower than C or C++
- It's not natively object-oriented

Advantages

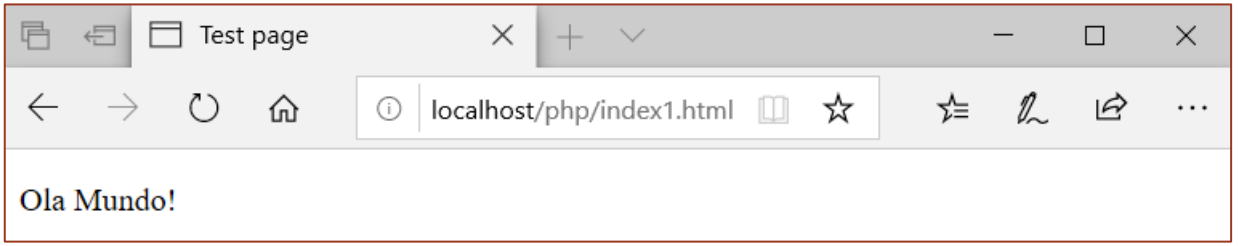
- Allows the fast development of applications
    - Does not need compilation and connection
- Resulting applications are stable and independent of the browser used
    - Also allows choosing the server platform
- Can connect to the most used database systems
- Partially supports object-oriented programming

  https://www.w3schools.com/php/php_oop_classes_objects.asp
- Runs in several platforms and is more powerful than ASP or JSP
- Has many users and solutions already implemented

Two different ways to use

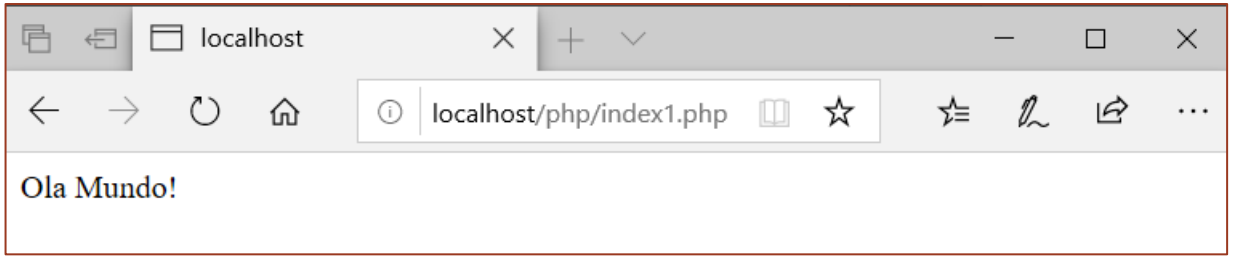
index1.html

```
1  <!DOCTYPE html>
2  <html lang="en">
3      <head>
4          <meta charset="utf-8">
5          <title>Test page</title>
6      </head>
7      <body>
8          <p>
9          <?php echo "Ola Mundo!"; ?>
10         </p>
11     </body>
12 </html>
```



index1.php

```
1  <?php
2      echo "Ola Mundo!";
3  ?>
```



Variable types

Group	Type	Example	Conversion
Scalar	boolean	`$b1 = True;` `$b2 = False;`	`$b3 = (bool)$i1; // True`

	integer	`$i1 = 123;`
		`$i2 = -123;`
		`$i3 = 0123; // octal (83)`
		`$i4 = 0x1A; // hexadecimal (26)`
			`$i5 = (int)$b1; // 1`
			`$i6 = (int)$b2; // 0`
			`$i7 = (int)$f1; // 1`
			`$i8 = (int)$f2; // 1`
			`$i9 = 1+ "123"  // 124`

	float	`$f1 = 1.234;`
		`$f2 = 1.734;`
		`$f3 = 1.2e3; // 1200`
		`$f4 = 7E-10; // 0.0000000007`
			`$f5 = 1 + "1.23" // 2.23`

	string	`$s1 = 'ab\nc'; // ab\nc`
		`$s2 = "ab\nc"; // ab`
		`// c`
		`$s3 = <<<FIM // ab`
		`ab // c`
		`c`
		`FIM;`
			`$s4 = "Price: $i1"`
			`// Price: 123`
			`$s5 = $s1{0} // a`
			`$s6 = $s1{1} // b`

FALSE values:
- Boolean FALSE
- Integer 0
- Real 0.0
- Empty String ""
- String "0"
- Array with no elements
- Special type NULL

Special characters:
- \n: new line
- \r: return
- \t: tab
- \\: backslash
- \$: dollar sign
- \": quote
- \[0-7]{1,3}: an octal
- \x[0-9A-Fa-f]{1,2}: an hexadecimal

Variable types

Group	Type	Example

Composed	array	`$a = array {1 => 'um', 2=> 'dois', 3 => 'tres'};`
		`$a[3] = 30; // array {1 => 'um', 2=> 'dois', 3 => 30}`
		`$a[ ] = 'quinze'; // array {1 => 'um', 2=> 'dois', 3 => 'tres', 4 =>'quinze'}`
		`unset($a[2]); // array {1 => 'um', 3 => 'tres' , 4 => 'quinze'}`
		
		`$b = array {'cor' => 'azul', 'forma' => 'quadrada'}`
		`$b['cor'] = 'azul';`
		`$b['forma'] = 'quadrada';`
		
		`$c = array{`
		`'cores' => array {'a'=>'azul','b'=>'amarelo','c'=>'branco'},`
		`'numeros' => array (1,2,3,4)`
		`}`

	object	`$o = new teste();` `$o->testar();`
Special	resource	`$ligacao = mysql_connect($server,$user,$password);`
	NULL	`$n = NULL // variable with no value`

Variables

- Name
  - Always starts with $.
  - Second character must be a letter or _
  - The remainder can be letters or numbers
- Reference (&)

```
$a = 'Ana';
$b = &$a; // $b points to $a
$b = 'Joana'; // also alters $a
```

- Scope
  - Global (next slide)
  - Static: keep their value even out of scope
- Variables of variables

```
$a = 'Ola';
$$a = 'Mundo';
echo "$a ${$a}";
echo "$a $Ola";
```

- Predefined vectorial variables

Vector	Description
$GLOBALS	Reference to each global variable
$_SERVER	Server variables (IP, port)
$_GET	Variables obtained with GET
$_POST	Variables obtained with POST
$_COOKIE	Variables obtained with *cookies*
$_FILES	Variables referring to file loading
$_ENV	Environment variables
$_REQUEST	Variables requested to the user
$_SESSION	Session variables

Variable scope

Global variables

- The scope is extended to the included files

```
$a = 2;
include "file.php"; // $a is available in file.php, which can generate warnings
// "require" has a similar behaviour → file.php can generate fatal warnings
// we can also use "include_once" and "require_once" (to avoid repetitions)
```

- The scope is not extended through functions…

```
$b = 3;
function func(){
    echo $b; // reference to a local variable (undefined)
}
```

- … unless it is explicitly specified

```
$a = 3;
$b = 2;
function mult(){
global $a, $b;
$b = $a*$b;
}
mult();
echo $b; // 6
```

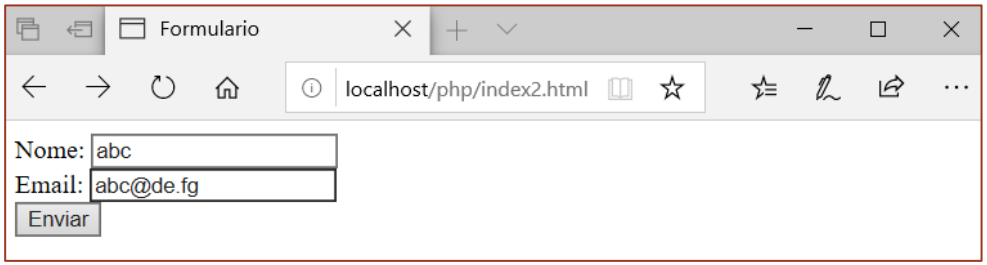
External variables (forms with GET and POST)

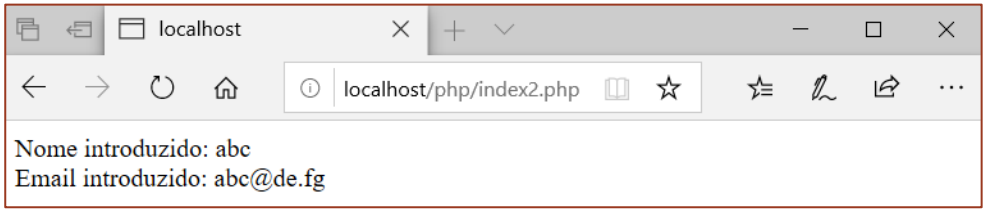
index2.html

```
1  <!DOCTYPE html>
2  <html lang="en">
3      <head>
4          <meta charset="utf-8">
5          <title>Formulario</title>
6      </head>
7      <body>
8          <form action="index2.php" method="post">
9              Nome: <input type="text" name="nome"></br>
10             Email: <input type="email" name="email"></br>
11             <input type="submit" value="Enviar">
12         </form>
13     </body>
14 </html>
```

index2.php

```
1  <?php
2      echo "Nome introduzido: " . $_POST['nome'] . "</br>";
3      echo "Email introduzido: " .$_POST['email'];
4  ?>
```






```
setcookie("mycookie","test",time()+3600);
// define a cookie named mycookie with value "test" with 1h (3600s) timespan

echo $_COOKIE['mycookie'];
// access the cookie
```

Arithmetic operators

Operator	Name	Example	Result
+	Addition	$x + $y	Sum of $x and $y
-	Subtraction	$x - $y	Difference of $x and $y
*	Multiplication	$x * $y	Product of $x and $y
/	Division	$x / $y	Quotient of $x and $y
%	Modulus	$x % $y	Remainder of $x divided by $y
**	Exponentiation	$x ** $y	Result of raising $x to the $y'th power

Fonte: https://www.w3schools.com/php/php_operators.asp

Assignment operators

Assignment	Same as...	Description
x = y	x = y	The left operand gets set to the value of the expression on the right
x += y	x = x + y	Addition
x -= y	x = x - y	Subtraction
x *= y	x = x * y	Multiplication
x /= y	x = x / y	Division
x %= y	x = x % y	Modulus

Fonte: https://www.w3schools.com/php/php_operators.asp

Comparison operators

Operator	Name	Example	Result
==	Equal	$x == $y	Returns true if $x is equal to $y
===	Identical	$x === $y	Returns true if $x is equal to $y, and they are of the same type
!=	Not equal	$x != $y	Returns true if $x is not equal to $y
<>	Not equal	$x <> $y	Returns true if $x is not equal to $y
!==	Not identical	$x !== $y	Returns true if $x is not equal to $y, or they are not of the same type
>	Greater than	$x > $y	Returns true if $x is greater than $y
<	Less than	$x < $y	Returns true if $x is less than $y
>=	Greater than or equal to	$x >= $y	Returns true if $x is greater than or equal to $y
<=	Less than or equal to	$x <= $y	Returns true if $x is less than or equal to $y
<=>	Spaceship	$x <=> $y	Returns an integer less than, equal to, or greater than zero, depending on if $x is less than, equal to, or greater than $y. Introduced in PHP 7.

Fonte: https://www.w3schools.com/php/php_operators.asp

Increment / decrement operators

Operator	Name	Description
++$x	Pre-increment	Increments $x by one, then returns $x
$x++	Post-increment	Returns $x, then increments $x by one
--$x	Pre-decrement	Decrements $x by one, then returns $x
$x--	Post-decrement	Returns $x, then decrements $x by one

Fonte: https://www.w3schools.com/php/php_operators.asp

Logical operators

Operator	Name	Example	Result
and	And	$x and $y	True if both $x and $y are true
or	Or	$x or $y	True if either $x or $y is true
xor	Xor	$x xor $y	True if either $x or $y is true, but not both
&&	And	$x && $y	True if both $x and $y are true
||	Or	$x || $y	True if either $x or $y is true
!	Not	!$x	True if $x is not true

Fonte: https://www.w3schools.com/php/php_operators.asp

Operators for strings

Operator	Name	Example	Result
.	Concatenation	$txt1 . $txt2	Concatenation of $txt1 and $txt2
.=	Concatenation assignment	$txt1 .= $txt2	Appends $txt2 to $txt1

Fonte: https://www.w3schools.com/php/php_operators.asp

Operators for arrays

Operator	Name	Example	Result
+	Union	$x + $y	Union of $x and $y
==	Equality	$x == $y	Returns true if $x and $y have the same key/value pairs
===	Identity	$x === $y	Returns true if $x and $y have the same key/value pairs in the same order and of the same types
!=	Inequality	$x != $y	Returns true if $x is not equal to $y
<>	Inequality	$x <> $y	Returns true if $x is not equal to $y
!==	Non-identity	$x !== $y	Returns true if $x is not identical to $y

Fonte: https://www.w3schools.com/php/php_operators.asp

Conditional operators

Operator	Name	Example	Result
?:	Ternary	$x = *expr1* ? *expr2* : *expr3*	Returns the value of $x. The value of $x is *expr2* if *expr1* = TRUE. The value of $x is *expr3* if *expr1* = FALSE
??	Null coalescing	$x = *expr1* ?? *expr2*	Returns the value of $x. The value of $x is *expr1* if *expr1* exists, and is not NULL. If *expr1* does not exist, or is NULL, the value of $x is *expr2*. Introduced in PHP 7

Fonte: https://www.w3schools.com/php/php_operators.asp

Conditional instructions

```
if($a == 0) {
    print "nenhum";
} elseif ($a == 1) {
    print "um";
} else {
    print "muitos";
}
```

```
switch($a) {
    case 0:
        print "nenhum";
        break;
     case 1:
        print "um";
        break;
    default:
        print "muitos";
}
```

Iterative instructions

```
$i = 0;
while($i < 10){
   print $i;
   i++;
}
```

```
$i = 0;
do {
   print $i;
   i++;
} while($i < 10)
```

```
for($i=0; $i<10; $i++){
   print $i;
}
```

```
$a = array (1,2,3,4);
foreach($a as $v){
   print $v;
}
```

```
$i = 0;
while(++$i){
   switch($i){
      case 3:
         print "tres";
         break 1; // breaks the switch only
      case 6:
         print "seis";
         break 2; // breaks the switch and the while
      default:
         break;
}
```

```
$a = array (1,2,3,4);
foreach($a as $v){
   if(($v % 2)==0) {
      continue;
   }
   impares($v);
}
```

Function

```
function cinco(){
   return 5;
}
$x = cinco(); // $x is now 5
```

```
function sum($p, $s = 1){ // arguments by omission
   return $p + $s;
}
$a = soma(2,3); // 5
$b = soma(2); // 3
```

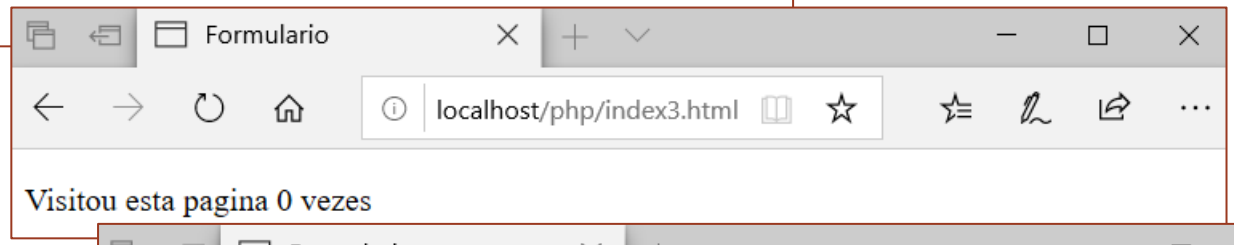
```
function conc(&$var){ // arguments by reference
   $var .= ' extra';
}
$h = 'horas';
conc($h);
echo $h; // 'horas extra'
```

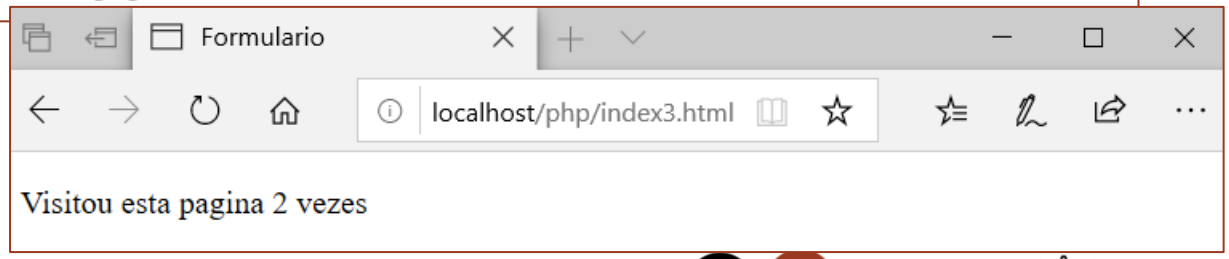
```
function vec(){
   return array (1,2,3);
}
$y = vec(); // $x = array (1,2,3)
```

Session variables

index3.html

```php
<!DOCTYPE html>
<html lang="en">
    <head>
        <meta charset="utf-8">
        <title>Formulario</title>
    </head>
    <body>
        <?php
            session_start();
            if(!isset($_SESSION['contador'])){
                $_SESSION['contador'] = 0;
            } else {
                $_SESSION['contador']++;
            }
        ?>
        <p>Visitou esta pagina <?php echo $_SESSION['contador'];?> vezes</p>
    </body>
</html>
```



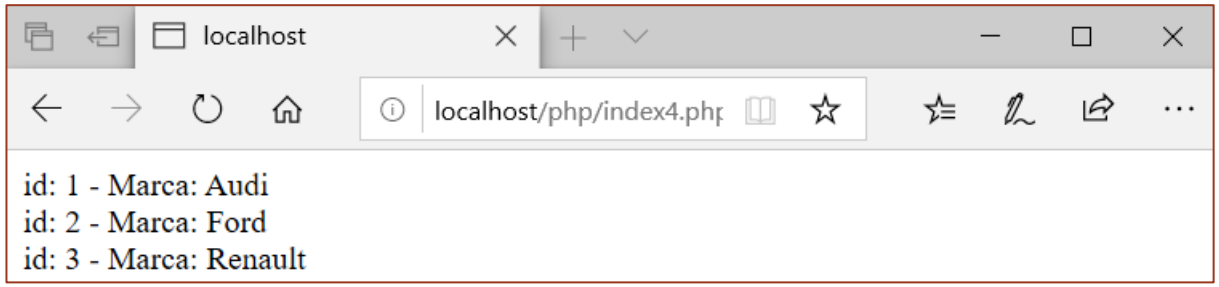


Connection to MySQL

index4.php

```php
<?php
    $servidor = "localhost";
    $user = "root";

    $ligacao = mysqli_connect($servidor,$user) or die("Sem ligação");
    mysqli_select_db($ligacao, "carros") or die("Sem DB");
    $consulta = "SELECT * FROM marca";
    $resultado = mysqli_query($ligacao,$consulta);
    if($resultado->num_rows > 0){
        while($row = $resultado->fetch_assoc()){
            echo "id: " . $row["mc_id"] . " - Marca: " . $row["mc_marca"] . "<br>";
        }
    } else {
        echo "0 results";
    }
?>
```



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Do conhecimento à prática.