

# CNT 4714: Enterprise Computing Fall 2011

## Introduction to PHP – Part 2

Instructor :      Dr. Mark Llewellyn  
                         markl@cs.ucf.edu  
                         HEC 236, 407-823-2790  
                         <http://www.cs.ucf.edu/courses/cnt4714/fall2011>

Department of Electrical Engineering and Computer Science  
Computer Science Division  
University of Central Florida



# Functions In PHP

- Functions are at the heart of a well-organized script and will make your code easy to read and reuse.
- Large projects would be unmanageable without functions because the problem of repetitive code would bog down the development process.
- If you haven't had any experience using functions, you can think of a function as an input/output machine. The machine takes the raw materials you feed it (the input) and works with them to produce a product (the output).
- A function accepts values, processes them, and then performs an action (printing to the browser, for example), returns a new value, or both.



# Functions In PHP

- If you need to bake a cake, you would probably do it yourself, in your own kitchen with your oven. But if you need to bake thousands of cakes, you would probably build or acquire a special cake-baking machine, built for making cakes in massive quantities.
- Similarly, when deciding whether to create a function for reuse or simply writing in-line code, the most important factor to consider is the extent to which it can save you from writing repetitive code.
- If the code you are writing will be used more than once, it is probably best to create a function to represent the code.



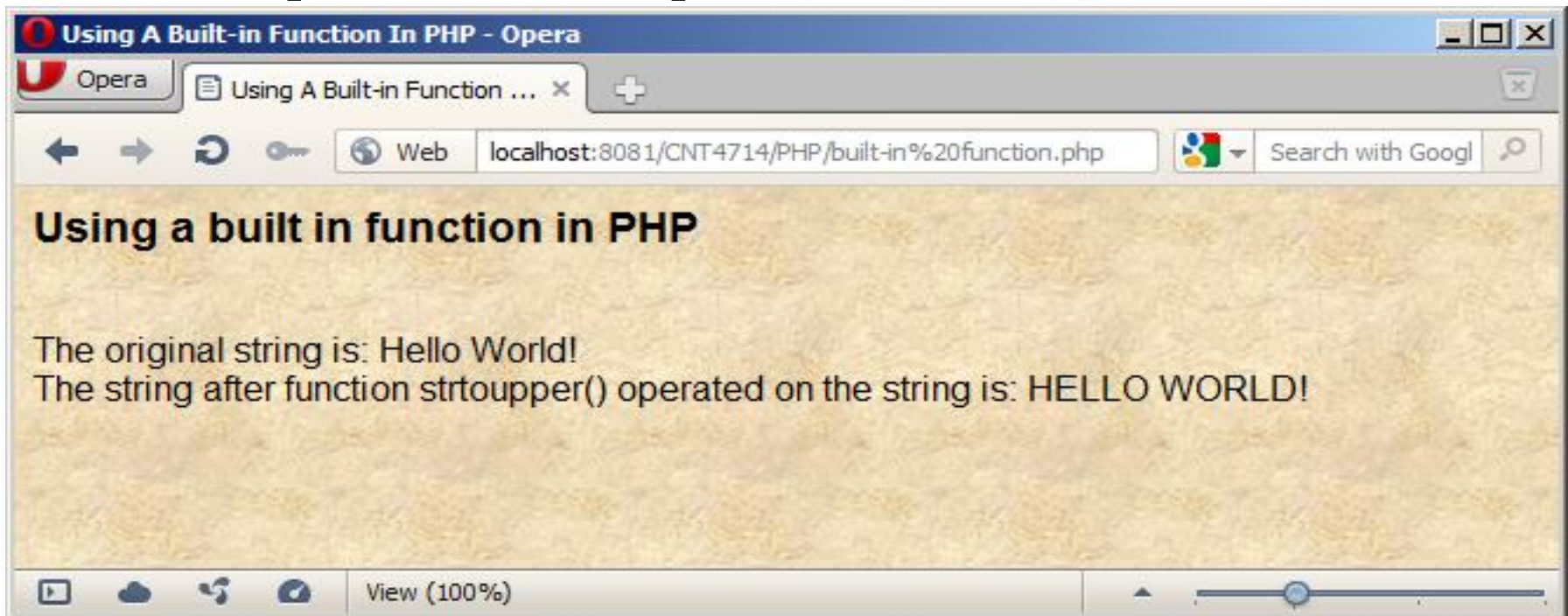
# Functions In PHP

- A function is a self-contained block of code that can be called by your script.
- When called (or invoked), the function's code is executed and performs a particular task. You can pass values to a function (called arguments), which then uses the values appropriately – storing them, transforming them, displaying them, whatever the function is designed to do. When finished, a function can also pass a value back to the original code that called it into action.
- In PHP, functions come in two flavors – those built in to the language, and those that you define yourself.

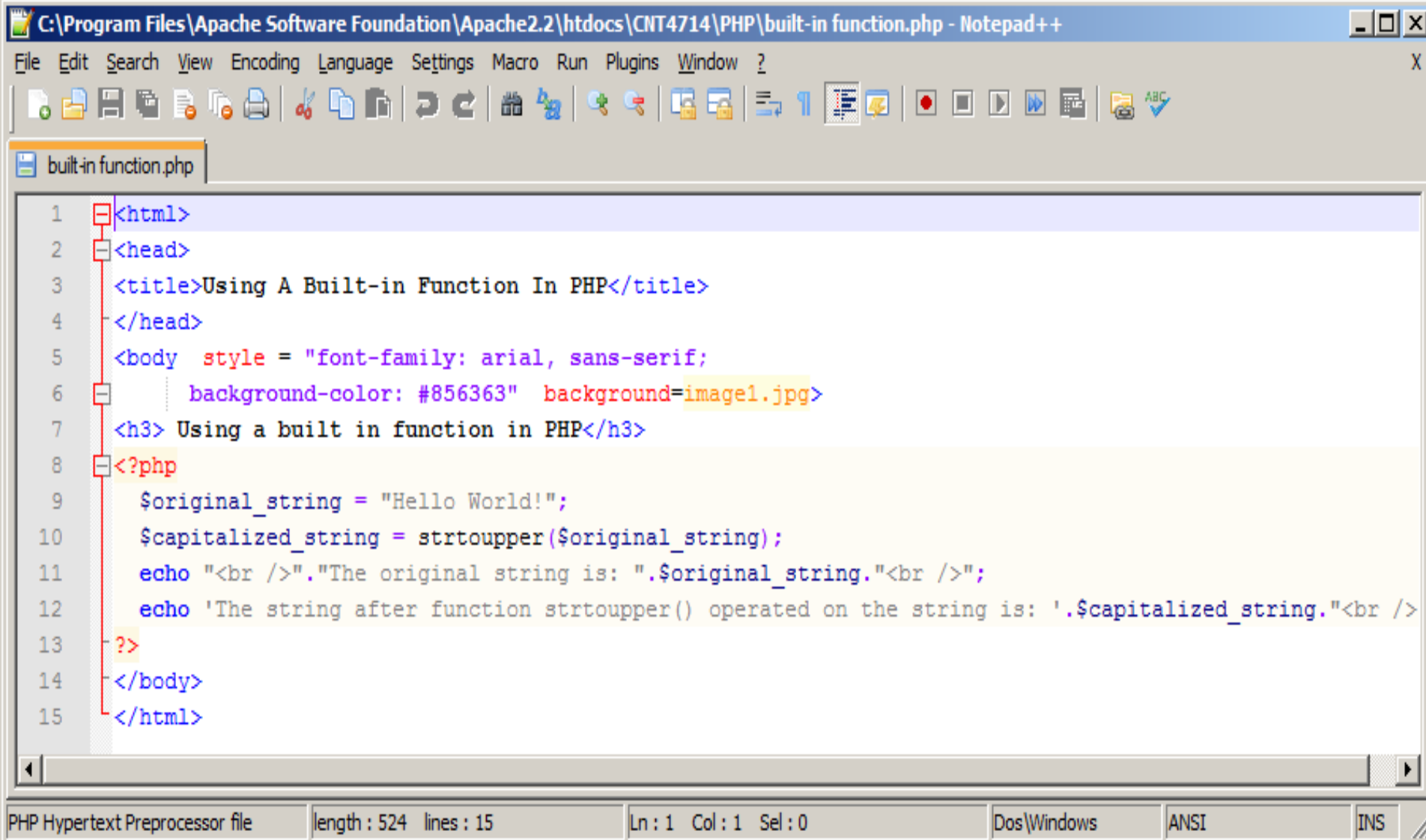


# Functions In PHP

- PHP has hundreds of built-in functions. Consider the example shown on the next page that utilizes the built-in function `strtoupper()`.
- The output from this script is shown below:



# Functions In PHP



The screenshot shows a Notepad++ window titled "C:\Program Files\Apache Software Foundation\Apache2.2\htdocs\CNT4714\PHP\built-in function.php - Notepad++". The code is as follows:

```
1 <html>
2 <head>
3   <title>Using A Built-in Function In PHP</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6   background-color: #856363" background=image1.jpg>
7 <h3> Using a built in function in PHP</h3>
8 <?php
9   $original_string = "Hello World!";
10  $capitalized_string = strtoupper($original_string);
11  echo "<br />". "The original string is: ".$original_string."<br />";
12  echo 'The string after function strtoupper() operated on the string is: '.$capitalized_string."<br />";
13  ?>
14 </body>
15 </html>
```

The status bar at the bottom indicates: "PHP Hypertext Preprocessor file", "length : 524 lines : 15", "Ln : 1 Col : 1 Sel : 0", "Dos\Windows", "ANSI", and "INS".



# Functions In PHP

- In the previous example, the function `strtoupper()` is called and passed a variable whose value is represented by a string. The function goes about its business of changing the contents of the string to uppercase letters.
- A function call consists of the function name followed by parentheses. (Note, even a function that has no parameters requires a set of parentheses.) The information being passed to the function (the arguments) are placed between the parentheses.
- For functions that require more than one argument, the arguments are separated by commas:

```
some_function ($an_argument, $another_argument);
```



# Functions In PHP

- The `strtoupper()` from the previous example is typical for a function in that it returns a value. Most functions return some information back after they've completed their task – they usually at least tell whether their mission was successful.
- The `strtoupper()` function returns a string value so its usage requires the presence of a variable to accept the returned string, as was the case in the line:

```
$capitalized_string = strtoupper($original_string);
```

- Functions in PHP that return values use a `return` statement within the body of the function. We'll use this in a few more pages when we start constructing our own functions.





# Defining Functions In PHP

- You can define your own functions in PHP using the `function` statement:

```
function someFunction($argument1, . . . ,argument2) {  
    //function code goes here  
}
```

- The name of the function follows the function statement and precedes a set of parentheses. If your function requires arguments, you must place the comma-separated variable names within the parentheses. These variables will be filled by the values passed to your function when it is called.
- Even if your function does not require arguments you must still supply the parentheses.



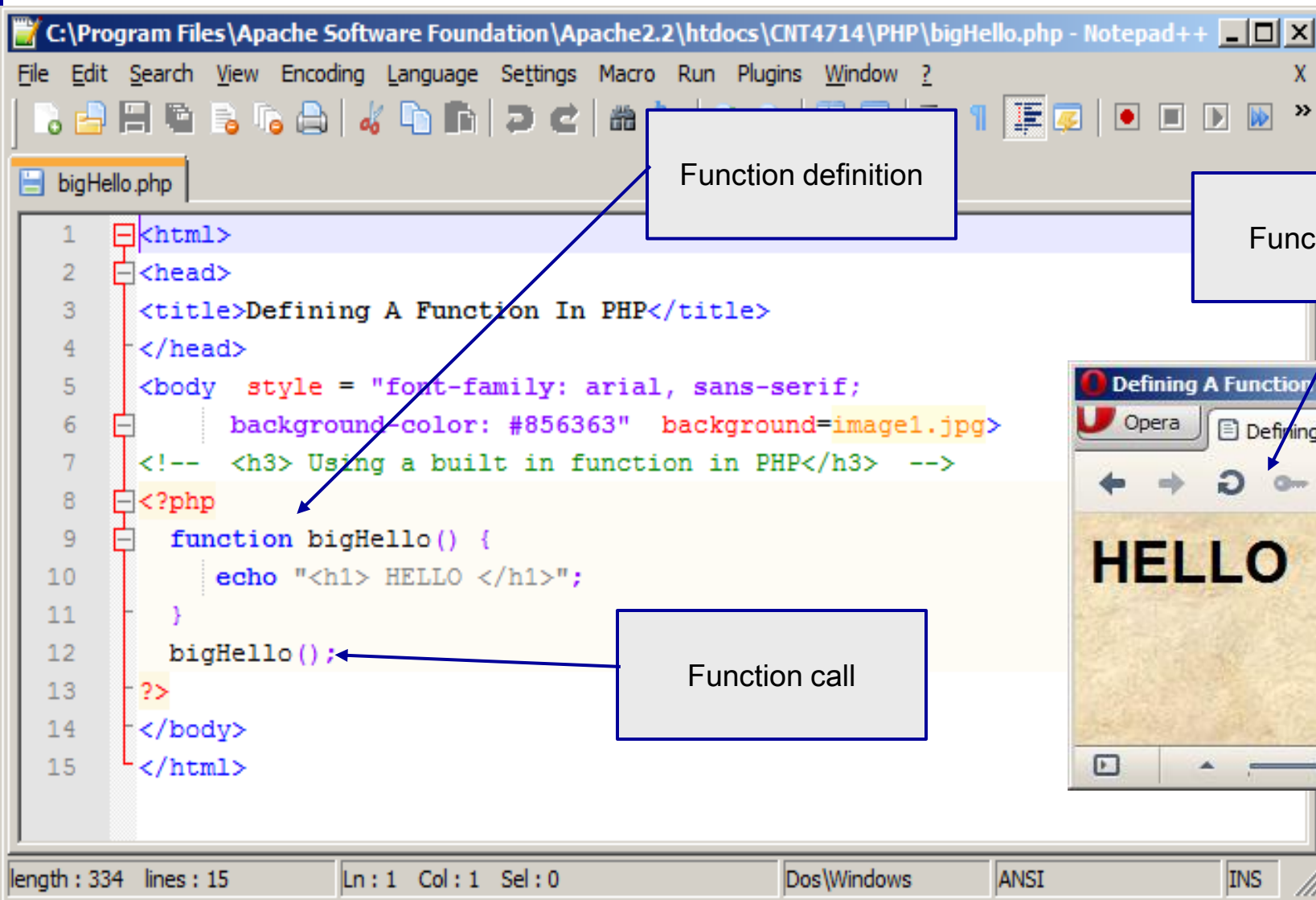
# Defining Functions In PHP

- Naming conventions for functions are the same as for normal variables in PHP. As with variables you should apply meaningful names and be consistent in naming and style. Using mixed case in function names is a common convention, thus `myFunction()` instead of `myfunction()` or `my_function()`. (Note: variables names are case sensitive in PHP, function names are not!)
- Let's define a simple function that simply prints out the word "Hello" in big letters.

```
function bigHello() {  
    echo "<h1> HELLO </h1>"  
}
```



# Defining Functions In PHP



```
1 <html>
2 <head>
3 <title>Defining A Function In PHP</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6 background-color: #856363" background=image1.jpg>
7 <!-- <h3> Using a built in function in PHP</h3> -->
8 <?php
9 function bigHello() {
10     echo "<h1> HELLO </h1>";
11 }
12 bigHello();
13 ?>
14 </body>
15 </html>
```

Function definition

Function call

Function result



# Defining Functions In PHP

- For the next example, let's define a function that requires an argument. Actually, let's define two different functions that each take an argument.
- The first function will take a string and print the string with a `<br />` element appended to the string. The second function will do the same, but append two `<br />` elements to the end of the string.



C:\Program Files\Apache Software Foundation\Apache2.2\htdocs\CNT4714\PHP\functionWithArgument.p...

File Edit Search View Encoding Language Settings Macro Run Plugins Window ?

functionWithArgument.php

```
1 <html>
2 <head>
3 <title>Defining A Function In PHP With An Argument</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=imageUrl.jpg>
7 <!-- <h3> Using a built in function in PHP</h3> -->
8 <?php
9     function appendSingleBreak($text) {
10         echo $text."<br />";
11     } //end function appendSingleBreak
12     function appendDoubleBreak($text) {
13         echo $text."<br /><br />";
14     } //end function appendDoubleBreak
15     appendSingleBreak("This is line 1.");
16     appendSingleBreak("This is line 2.");
17     appendSingleBreak("This is line 3.");
18     appendDoubleBreak("This is line 4.");
19     appendDoubleBreak("This is line 5.");
20     appendDoubleBreak("This is line 6.");
21     ?>
22 </body>
23 </html>
```

length : 735 lines : 23 Ln : 1 Col : 1 Sel : 0

Defining A Function In PHP With An Argument ...

Opera Defining A Function In P... x

Web localhost:8081/C

This is line 1.  
This is line 2.  
This is line 3.  
This is line 4.  
  
This is line 5.  
  
This is line 6.

Dos\Windows ANSI INS



# Defining Functions In PHP

- For the next example, let's define a function that requires two arguments. We'll basically repeat the exercise from the previous example, but in this case rather than writing two different functions that differ only in the number of `<br />` elements they append to a line of text, the new function will have a second argument that represents the number of `<br />` elements to be appended. Clearly this would be more efficient, in terms of code, than creating a different function for each number of `<br />` elements we might want to append.
- In the first version of this example, shown on the next page, I simply repeated the same effect as in the previous version, so the two screen shots from the browser should look identical.
- The second version of this example, shown on page 15, a different effect is produced by the function calls.



C:\Program Files\Apache Software Foundation\Apache2.2\htdocs\CNT4714\PHP\functionWithTwoArgum...

File Edit Search View Encoding Language Settings Macro Run Plugins Window ?

functionWithTwoArguments.php

```
1 <html>
2 <head>
3 <title>Defining A Function In PHP With Two Arguments</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=image1.jpg>
7 <!-- <h3> Using a built in function in PHP</h3> -->
8 <?php
9 function appendBreaks($text, $number) {
10     echo $text;
11     for($i = 1; $i <= $number; $i++){
12         echo "<br />";
13     }
14 } //end function appendBreaks
15 appendBreaks("This is line 1.", 1);
16 appendBreaks("This is line 2.", 1);
17 appendBreaks("This is line 3.", 1);
18 appendBreaks("This is line 4.", 2);
19 appendBreaks("This is line 5.", 2);
20 appendBreaks("This is line 6.", 0);
21 ?>
22 </body>
23 </html>
```

Defining A Function In PHP With ...

Opera Defining A Fu... x

This is line 1.  
This is line 2.  
This is line 3.  
This is line 4.  
  
This is line 5.  
  
This is line 6.

length : 668 lines : 23 Ln : 1 Col : 1 Sel : 0 Dos\Windows ANSI INS



C:\Program Files\Apache Software Foundation\Apache2.2\htdocs\CNT4714\PHP\functionWithTwoArgument...

File Edit Search View Encoding Language Settings Macro Run Plugins Window ?

functionWithTwoArguments.php functionWithTwoArgumentsV2.php

```
1 <html>
2 <head>
3 <title>Defining A Function In PHP With Two Argume
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=imag
7 <!-- <h3> Using a built in function in PHP</h3>
8 <?php
9 function appendBreaks($text, $number) {
10     echo $text;
11     for($i = 1; $i <= $number; $i++){
12         echo "<br />";
13     }
14 } //end function appendBreaks
15 appendBreaks("This is line 1.", 4);
16 appendBreaks("This is line 2.", 1);
17 appendBreaks("This is line 3.", 3);
18 appendBreaks("This is line 4.", 10);
19 appendBreaks("This is line 5.", 2);
20 appendBreaks("This is line 6.", 0);
21 ?>
22 </body>
23 </html>
```

length : 681 lines : 23 Ln : 1 Col : 1 Sel : 0 Dos\Window

Defining A Function In PHP... Opera Definin... x

This is line 1.

This is line 2.  
This is line 3.

This is line 4.

This is line 5.  
This is line 6.





# Defining Functions In PHP

- As a final example of simple function definition, let's construct a function that returns a value.
- In the previous two examples, the string that had the `<br />` elements appended to it was simply printed out in the browser. Sometimes, however, you will want the function to provide a value that you can work with yourself. For example, if the function had returned the appended string, we could have passed that to another function to further process the amended string before it was printed.
- Let's construct a function that will take three integer arguments and determine the largest of the argument values and return this value to the caller.



C:\Program Files\Apache Software Foundation\Apache2.2\htdocs\CNT4714\PHP\functionWithReturnValu...

File Edit Search View Encoding Language Settings Macro Run Plugins Window ?

functionWithReturnValue.php

```
1 <html>
2 <head>
3 <title>Defining A Function In PHP With A Return Value</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=imagem1.jpg>
7 <?php
8     function findMax($one, $two, $three) {
9         if (($one >= $two) && ($one >= $three)) {
10            return $one;
11        } elseif (($two >= $one) && ($two >= $three)) {
12            return $two;
13        } elseif (($three >= $one) && ($three >= $two)) {
14            return $three;
15        }
16    } //end function findMax
17    $currentMax = findMax(12,13,14);
18    echo "The maximum value is: $currentMax <br />";
19    $currentMax = findMax(2,4,3);
20    echo "The maximum value is: $currentMax <br />";
21    $currentMax = findMax(24,12,3);
22    echo "The maximum value is: $currentMax <br />";
23 ?>
24 </body>
25 </html>
```

length : 775 lines : 25 Ln : 1 Col : 1 Sel : 0 Dos\Windows ANSI INS

Defining A Function In PHP With ...

Opera Defining A Fun... x

The maximum value is: 14  
The maximum value is: 4  
The maximum value is: 24



# Defining Functions In PHP

- The `return` statement can return a value or nothing at all.
- How you arrive at a value passed by a `return` statement can vary.
  - The value can be hard-coded: `return 4;`
  - It can be the result of an expression: `return $a/$b;`
  - It can be the value returned by yet another function call:  
`return anotherFunction($an_argument);`



# Variable Scope

- A variable that is declared within a function remains local to that function. In other words, that variable is not available outside of the function or within other functions.
- This is referred to as the **scope** of a variable.
- This also implies that variable names are not required to be unique across functions. Therefore the same variable can be defined in more than one function.
- The following example illustrates the scope of a variable. Notice that both functions `functionOne` and `functionTwo` declare variables named `myInt`.





```

1 <html>
2 <head>
3 <title>Variable Scope In PHP Functions</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=image1.jpg>
7 <?php
8     function functionOne($one) {
9         $myInt = $one;
10        echo 'The value of '. '$myInt in functionOne is: '. $myInt. "<br />";
11    } //end functionOne
12    function functionTwo($two) {
13        $myInt = $two;
14        echo 'The value of '. '$myInt in functionTwo is: '. $myInt. "<br />";
15    } //end functionTwo
16    $arg1 = 4;
17    $arg2 = 6;
18    functionOne($arg1);
19    functionTwo($arg2);
20    echo 'The value of $one is: '. $one. "<br />"; //uncomment this line to see error
21    echo 'The value of $two is: '. $two. "<br />"; //uncomment this line to see error
22    echo 'The value of $myInt is: '. $myInt. "<br />";
23    ?>
24 </body>
25 </html>

```



# Defining Functions In PHP

The screenshot shows a web browser window titled "Variable Scope In PHP Functions - Opera". The address bar shows "localhost:8081/CNT4714/PHP/variable%". The page content displays the following:

The value of \$myInt in functionOne is: 4  
The value of \$myInt in functionTwo is: 6

**Notice:** Undefined variable: one in C:\Program Files\Apache Software Foundation\Apache2.2\htdocs\CNT4714\PHP\variable scope.php on line 20  
The value of \$one is:

**Notice:** Undefined variable: two in C:\Program Files\Apache Software Foundation\Apache2.2\htdocs\CNT4714\PHP\variable scope.php on line 21  
The value of \$two is:

**Notice:** Undefined variable: myInt in C:\Program Files\Apache Software Foundation\Apache2.2\htdocs\CNT4714\PHP\variable scope.php on line 22  
The value of \$myInt is:

Annotations:

- A blue box with the text "Inside the functions the variable is visible (it is in scope)" has an arrow pointing to the two lines of output.
- A blue box with the text "Outside the functions the variables are not visible (they are out of scope)." has an arrow pointing to the three error messages.



# Defining Functions In PHP

The screenshot shows a web browser window titled "Variable Scope In PHP Functions - Opera". The address bar shows "localhost:8081/CNT4714/PHP/variable%". The main content area displays the following text:

The value of \$myInt in functionOne is: 4  
The value of \$myInt in functionTwo is: 6

**Notice:** Undefined variable: myInt in C:\Program Files\Apache Software Foundation\Apache2.2\htdocs\CNT4714\PHP\variable scope.php on line 22  
The value of \$myInt is:

Two callout boxes with blue arrows provide context:

- The top callout box points to the function output and contains the text: "Inside the functions the variable is visible (it is in scope)".
- The bottom callout box points to the "Notice" and "The value of \$myInt is:" text and contains the text: "Outside the functions the variable is not visible (it is out of scope)."



# Variable Scope

- Similar to a variable defined inside a function having no scope outside of the function, a variable declared outside of a function is not accessible from inside the function.
- In general, if a function needs information from outside of the function in order to accomplish its task, the information should be passed as an argument to the function.
- Having said this however, there are times when you might want to access an important variable without passing it in as an argument. This is accomplished in PHP with the `global` statement. The **global** statement allows a function to access a variable declared outside of the function. More than one variable can be declared global at one time by separating the variable names with commas.
- The following example illustrates this concept using a variation of the previous example.







variable scope V2.php

```

8  <?php
9      $alpha = 14; // $alpha is declared outside of any functions
10     $beta = 10; // $beta too is declared outside of any functions
11     function functionOne($one) {
12         global $alpha; // allow functionOne access to $alpha
13         $myInt = $one;
14         $alpha = $alpha + $myInt;
15         echo 'The value of '. '$myInt in functionOne is: '. $myInt. "<br />";
16         echo 'The value of '. '$alpha in functionOne is: '. $alpha. "<br /> <br />";
17     } //end functionOne
18     function functionTwo($two) {
19         global $alpha; // allow functionTwo access to $alpha
20         $myInt = $two;
21         echo 'The value of '. '$alpha in functionTwo is: '. $alpha. "<br />";
22         echo 'The value of '. '$myInt in functionTwo is: '. $myInt. "<br />";
23         // $beta is out of scope here - next line generates an error
24         echo 'The value of '. '$beta in functionTwo is: '. $beta. "<br />";
25     } //end functionTwo
26     $arg1 = 4;
27     $arg2 = 6;
28     functionOne($arg1);
29     functionTwo($arg2);
30     //both $alpha and $beta are in scope here
31     echo 'The value of $alpha is: '. $alpha. "<br />"; //note value of $alpha changed by fu
32     echo 'The value of $beta is: '. $beta. "<br />";
33     ?>

```



# Using the global statement in PHP

The value of \$myInt in functionOne is: 4  
The value of \$alpha in functionOne is: 18

The value of \$alpha in functionTwo is: 18  
The value of \$myInt in functionTwo is: 6

**Notice:** Undefined variable: beta in C:\Program Files\Apache Software Foundation\Apache2.2\htdocs\CNT4714\PHP\variable scope V2.php on line 24

The value of \$beta in functionTwo is:  
The value of \$alpha is: 18  
The value of \$beta is: 10

Inside functionOne the variable \$alpha is visible via the global statement. Note that the function modified the value of \$alpha.

Inside functionTwo the variable \$alpha is also visible via the global statement. The third echo statement in this function will generate the error when it attempts to reference the variable \$beta which is not in scope.

Outside of the functions the variables are again in scope and notice the modified value of \$alpha.



# Saving State Between Function Calls

- Local variables within functions have a short but happy life – they come into existence when the function is called and die when the execution of the function is finished.
- Occasionally, however, you might want to give a function a rudimentary memory.
- For example, suppose that you'd like a function to keep track of the number of times it has been called so that numbered headings can be created by a script.
- You could of course accomplish this by using the global statement and accessing a variable declared outside of the function. The example on the next page illustrates this technique.



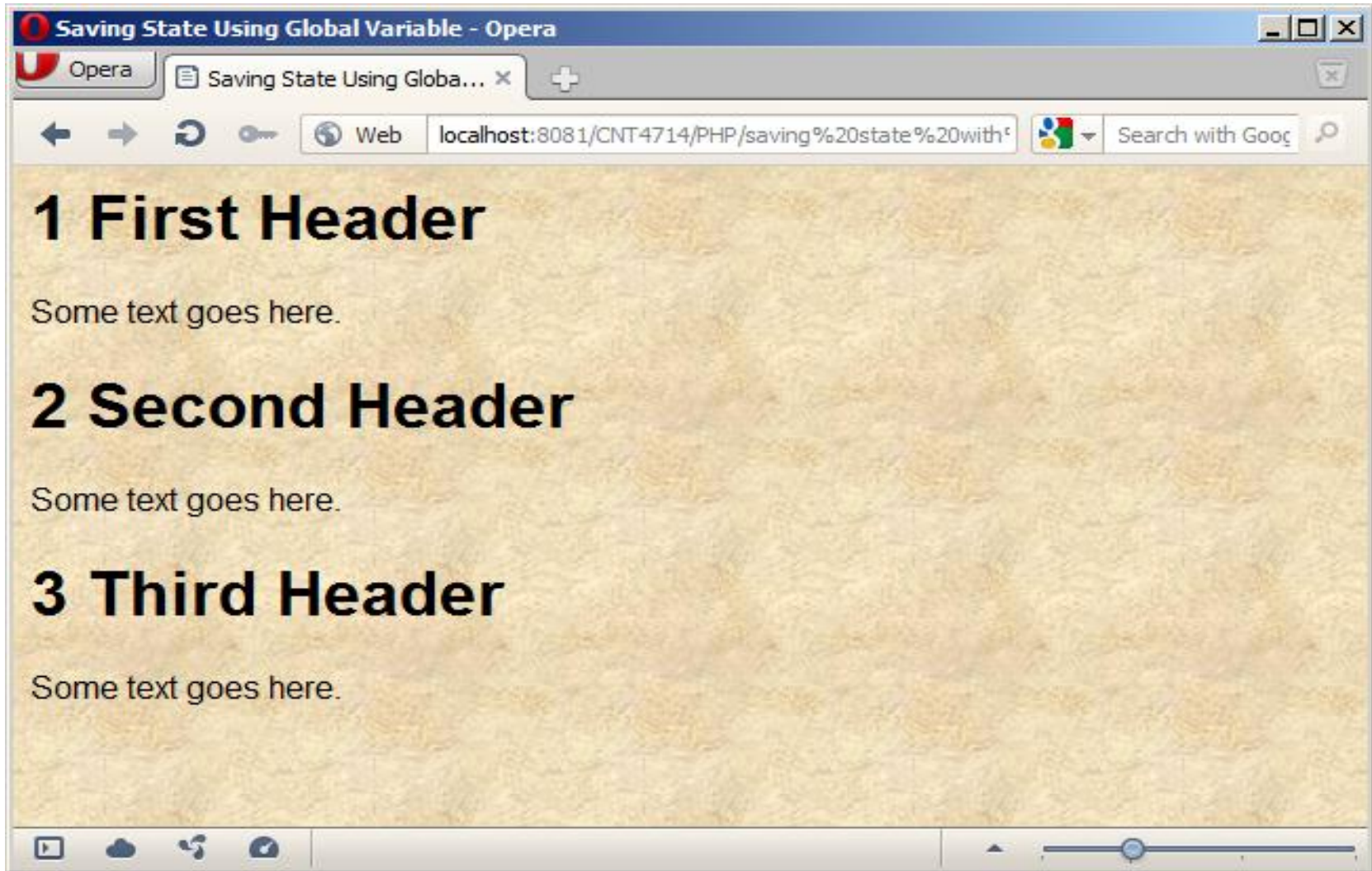


saving state with global.php

```
1 <html>
2 <head>
3 <title>Saving State Using Global Variable</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=imagem1.jpg>
7 <?php
8     $number_of_calls = 0; // number of times the function has been called
9     function numberedHeading($txt) {
10         global $number_of_calls; //allow function access to $number_of_calls
11         $number_of_calls++;
12         echo "<h1>".$number_of_calls." ".$txt."</h1>";
13     } //end numberedHeading
14     numberedHeading("First Header");
15     echo "<p> Some text goes here.</p>";
16     numberedHeading("Second Header");
17     echo "<p> Some text goes here.</p>";
18     numberedHeading("Third Header");
19     echo "<p> Some text goes here.</p>";
20 ?>
21 </body>
22 </html>
```



# Saving State Between Function Calls



# Saving State Between Function Calls

- The previous example illustrated providing a function some “memory” through the use of a global variable.
- This is not a very elegant way to achieve this task. **Why?**
- **Answer:** Functions that use the global statement cannot be read as standalone blocks of code. In reading or reusing them, you must look out for the global variables that they manipulate. Failing to do so will render the function useless.
- This is where the `static` statement comes into play in PHP.
- Declaring a variable within a function to be static, the variable remains local to the function and the function remembers its value from execution to execution. The next example illustrates the `static` statement.





saving state with global.php saving state using static.php

```
1 <html>
2 <head>
3 <title>Saving State Using the Static Statement</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=imageUrl.jpg>
7 <?php
8     function numberedHeading($txt) {
9         static $number_of_calls = 0; // number of times the function has been called
10        $number_of_calls++;
11        echo "<h1>".$number_of_calls." ".$txt."</h1>";
12    } //end numberedHeading
13    numberedHeading("First Header");
14    echo "<p> Some text goes here.</p>";
15    numberedHeading("Second Header");
16    echo "<p> Some text goes here.</p>";
17    numberedHeading("Third Header");
18    echo "<p> Some text goes here.</p>";
19    numberedHeading("Fourth Header"); //added to differentiate from previous example
20    echo "<p> Some text goes here.</p>";
21 >>
22 </body>
23 </html>
```

PHP Hyper length : 785 lines : 23

Ln : 1 Col : 1 Sel : 0

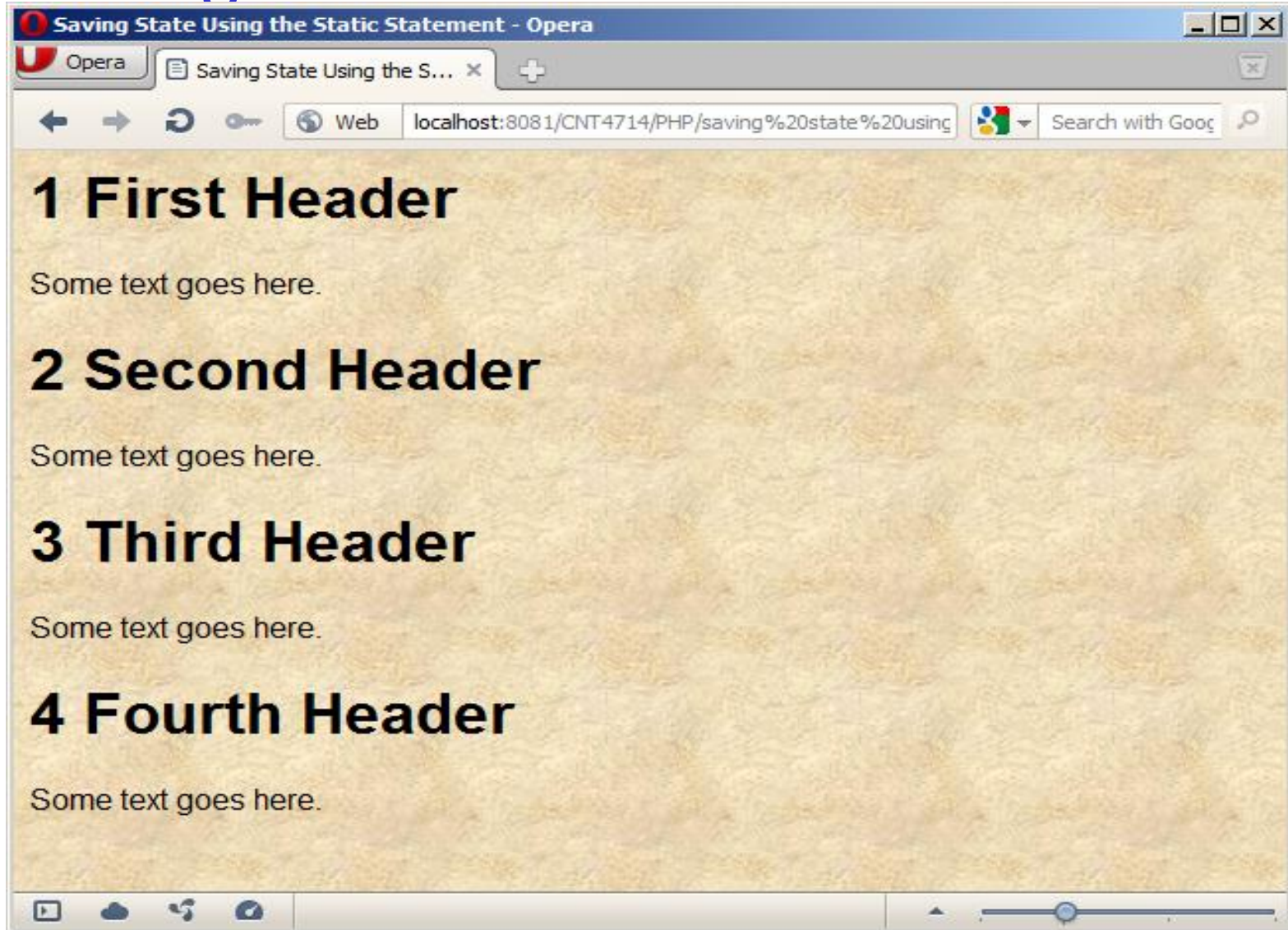
Dos\Windows

ANSI

INS



# Saving State Between Function Calls





# Setting Default Values For Arguments

- PHP provides a nifty feature to help you construct flexible functions. For functions that require one or more arguments, you can specify that some arguments are optional. This makes your functions more flexible.
- To illustrate the concept of the usefulness of setting default argument values, let's build a function that takes a string of text and an integer that corresponds to the point size in which the string is to be printed in the browser.
- This is shown on the next page.



C:\Program Files\Apache Software Foundation\Apache2.2\htdocs\CNT4714\PHP\default arguments V1.php - Notepad++

File Edit Search View Encoding Language Settings Macro Run Plugins Window ?

Opera Default Argument Values - V1 - Opera

Web localhost:8081/C

```
1 <html>
2 <head>
3 <title>Default Argument Values - V1</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=image1.jpg>
7 <?php
8     function fontWrapper($txt, $fontsize) {
9         echo "<span style=\"font-size:$fontsize\" >\".$txt.\"</span>";
10    } //end numberedHeading
11    fontWrapper("A Heading <br />", "24pt");
12    fontWrapper("Some text in the body <br />", "16pt");
13    fontWrapper("Some smaller text in the body <br />", "12pt");
14    fontWrapper("Some even smaller text in the body <br />", "8pt");
15 >?>
16 </body>
17 </html>
```

A Heading  
Some text in the body  
Some smaller text in the body  
Some even smaller text in the body

PHP Hyper length : 571 lines : 17 Ln : 1 Col : 1 Sel : 0 Dos\Windows ANSI INS



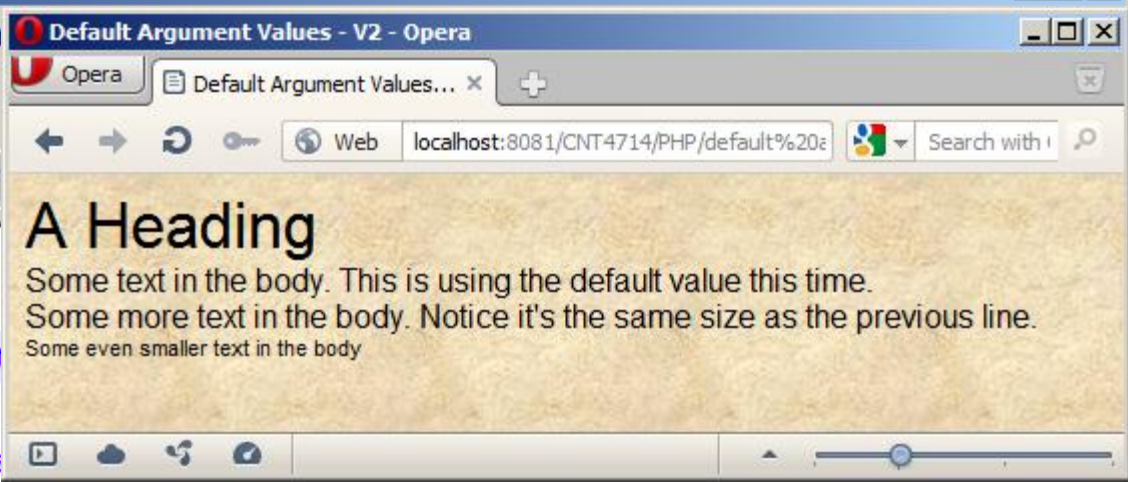
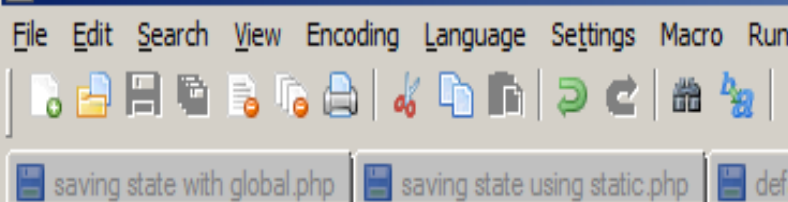
# Setting Default Values For Arguments

- The nifty feature that PHP provides is to allow you to assign a value to a function argument within the function definition's parentheses.
- The effect of this is to make the argument value passed from the caller optional as the argument will assume the default value if no value is provided by the caller. The next example modifies the previous example to make use of this feature of PHP.

## WARNING

You can create as many optional arguments to a function as you wish. However, the arrangement of the arguments becomes important. Once an optional argument is defined in a function definition, all subsequent arguments must also be optional. In other words, you cannot have the first argument be optional, the second argument required, the third argument optional and so on. The ordering must be: all required arguments followed by all optional arguments.





```
1 <html>
2 <head>
3 <title>Default Argument Values - V2</title>
4 </head>
5 <body style = "font-family: arial, serif; background-color: #856363" background=image1.jpg>
6 <?php
7
8 function fontWrapper($txt, $fontsize = "12pt") {
9     echo "<span style=\"font-size:$fontsize\" >\".$txt.\"</span>";
10 } //end numberedHeading
11 fontWrapper("A Heading <br />", "24pt");
12 fontWrapper("Some text in the body. This is using the default value this time.<br />");
13 fontWrapper("Some more text in the body. Notice it's the same size as the previous line. <br />");
14 fontWrapper("Some even smaller text in the body <br />", "8pt");
15 ?>
16 </body>
17 </html>
```

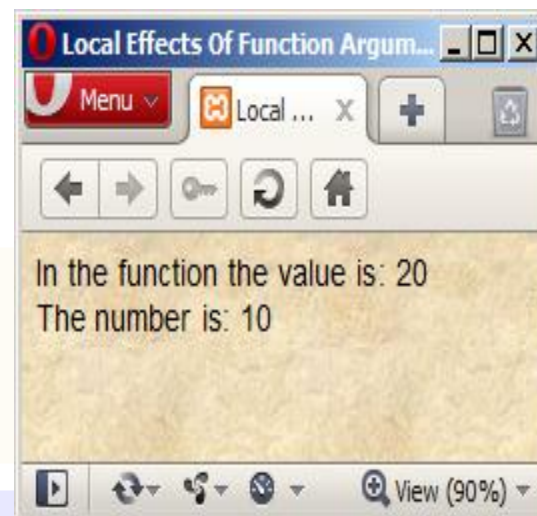
The second parameter has a default value specified making it an optional parameter to the function. The 2<sup>nd</sup> and 3<sup>rd</sup> calls make use of this default value.



# Passing Variable References To Functions

- When you pass arguments to functions, they are stored as copies in parameter variables. This means that any changes made to these variables by the function is local to the function and are not reflected beyond it.
- The example on the next page illustrates argument passing by value.

```
2 <head>
3 <title>Local Effects Of Function Arguments</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=image1.jpg>
7 <?php
8     function add10($num) {
9         $num += 10;
10        echo "In the function the value is: $num <br />";
11    } //end add10
12    $original_num = 10;
13    add10($original_num);
14    echo "The number is: $original_num <br/>";
15 <?>
16 </body>
17 </html>
```

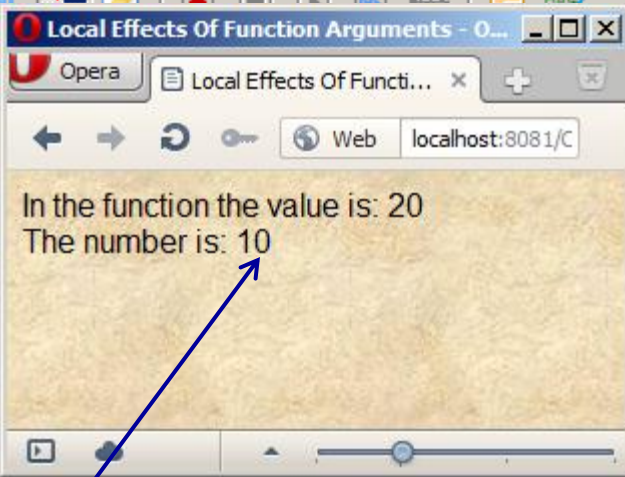




```

1 <html>
2 <head>
3 <title>Local Effects Of Function Arguments</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=imagem1.jp
7 <?php
8     function add10($num) {
9         $num += 10;
10        echo "In the function the value is: $num <br />";
11    } //end add10
12    $original_num = 10;
13    add10($original_num);
14    echo "The number is: $original_num <br/>";
15 ?>
16 </body>
17 </html>

```



Upon return the value of \$original\_num is unchanged by the function.



# Passing Variable References To Functions

- By default in PHP, variables passed to functions are passed by value. In other words, only local copies of the variables are used by the functions and the original values of the variables are not accessible by the function.
- So how can you allow a function to actually modify a variable sent to it? You must create a reference to the variable.
- The reference operator in PHP is the & (ampersand). Placing an ampersand in front of an argument in a function definition creates a reference to the variable and allows the function to modify the original variable.
- The following example modifies the previous example to make use of passing an argument by reference.



# Passing Variable References To Functions

The argument `$num` is passed by reference since it is preceded with the `&` operator.  
Upon return from the function the value of `$original_num` has been changed.

```
1 <html>
2 <head>
3 <title>Pass By Reference Example</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=imagem1.jpg>
7 <?php
8     function add10(&$num) {
9         $num += 10;
10        echo "In the function the value is: $num <br />";
11    } //end add10
12    $original_num = 10;
13    add10($original_num);
14    echo "The number is: $original_num <br/>";
15 ?>
16 </body>
17 </html>
```

