CNT 4714: Enterprise Computing Spring 2011

Introduction to PHP – Part 2

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- 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.

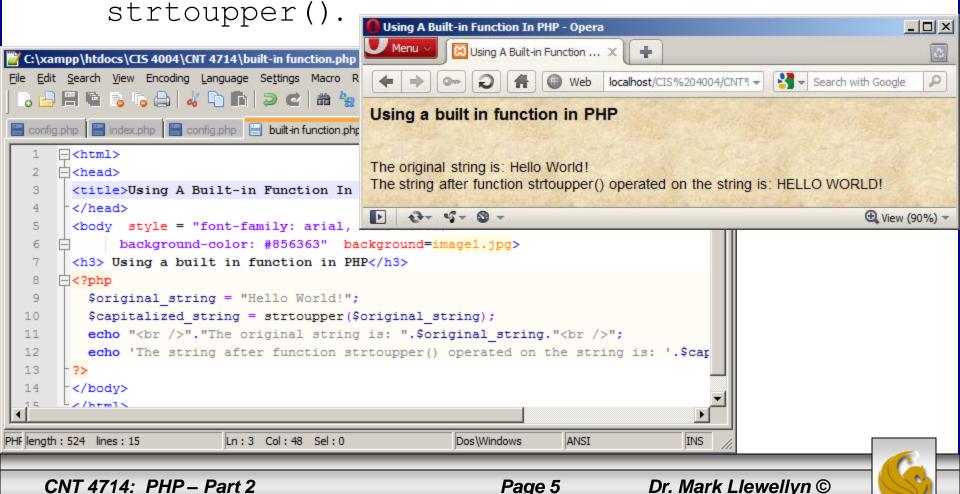
- If you need to bake a cake, you would probably do it yourself, in your own kitchen with your oven. But if you need to bake thousands of cakes, you would probably build or acquire a special cake-baking machine, built for making cakes in massive quantities.
- Similarly, when deciding whether to create a function for reuse, 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.



- 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.



• PHP has hundreds of built-in functions. Consider the following example that utilizes the built-in function



- 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);



- 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.



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

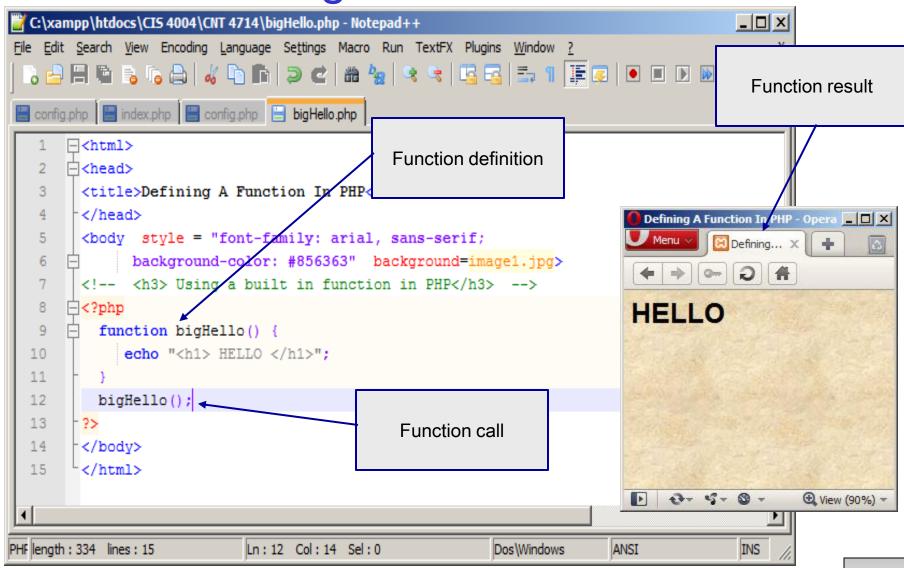
```
function someFunction($argument1,...,argument2) {
    //function code goes here
}
```

- 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.

- 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.

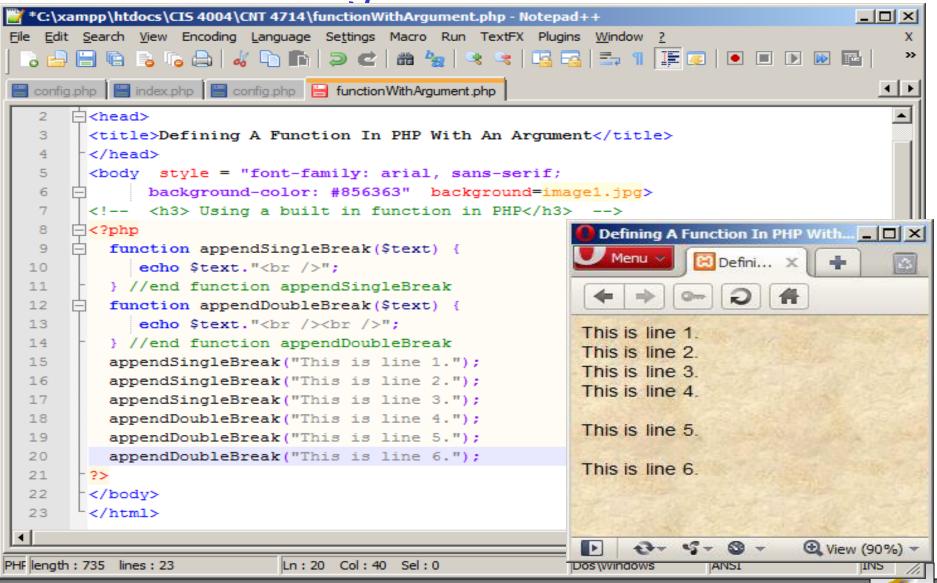
```
function bigHello() {
  echo "<h1> HELLO </h1>"
}
```





- 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.





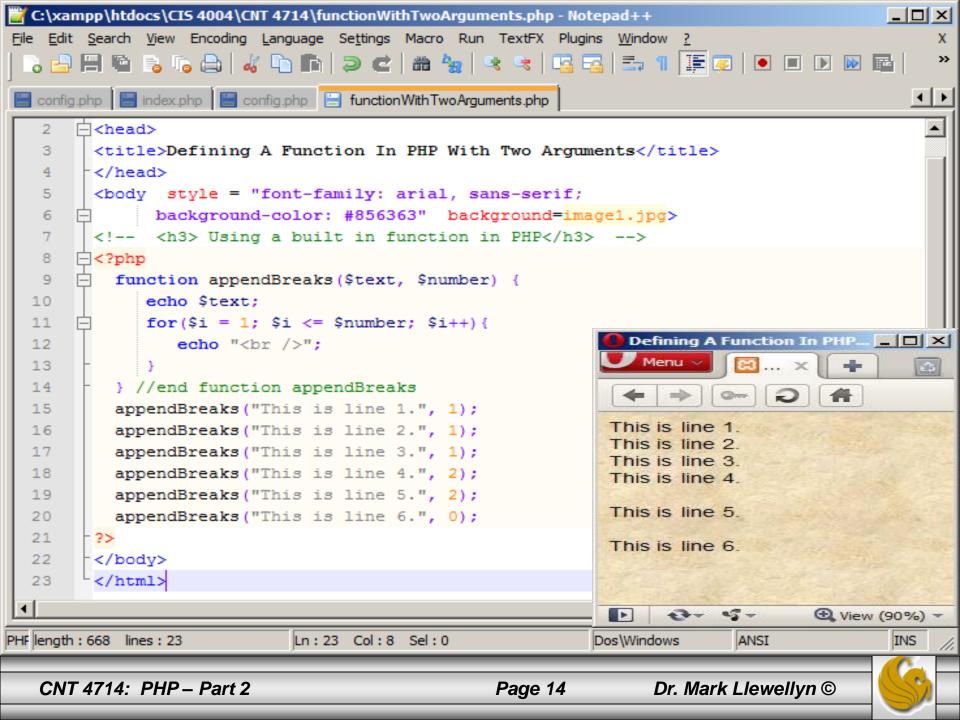
- For the next example, let's define a function that requires two arguments. We'll basically repeat the exercise from the previous example, but in this case rather than writing two different functions that differ only in the number of

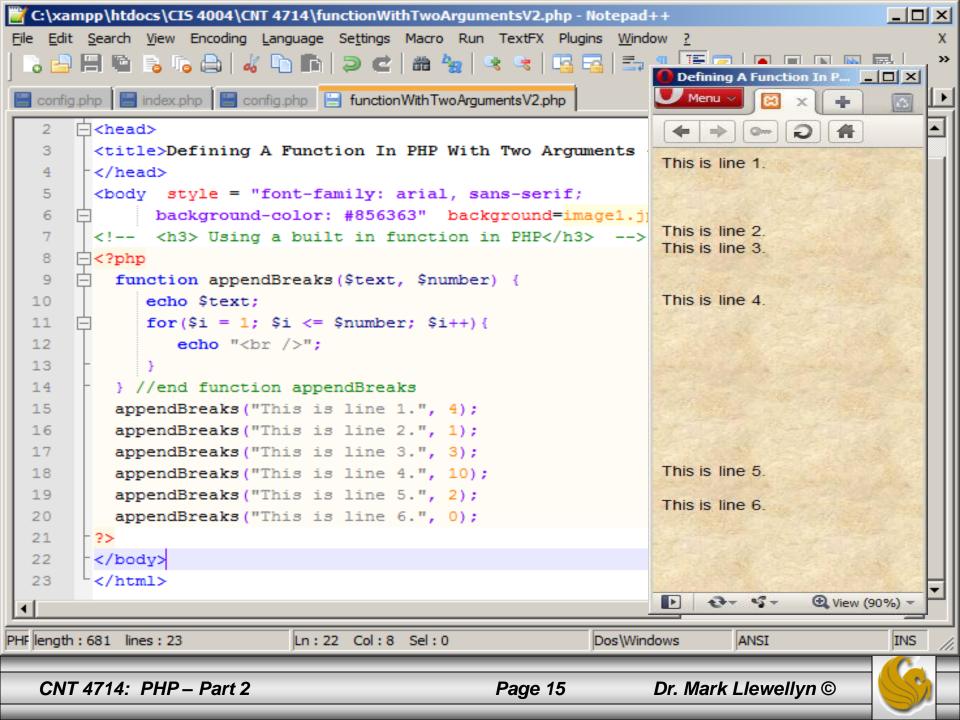
 | pr /> elements they append to a line of text, the new function will have a second argument that represents the number of

 | pr /> elements to be appended. Clearly this would be more efficient, in terms of code, than creating a different function for each number of

 | pr /> 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.

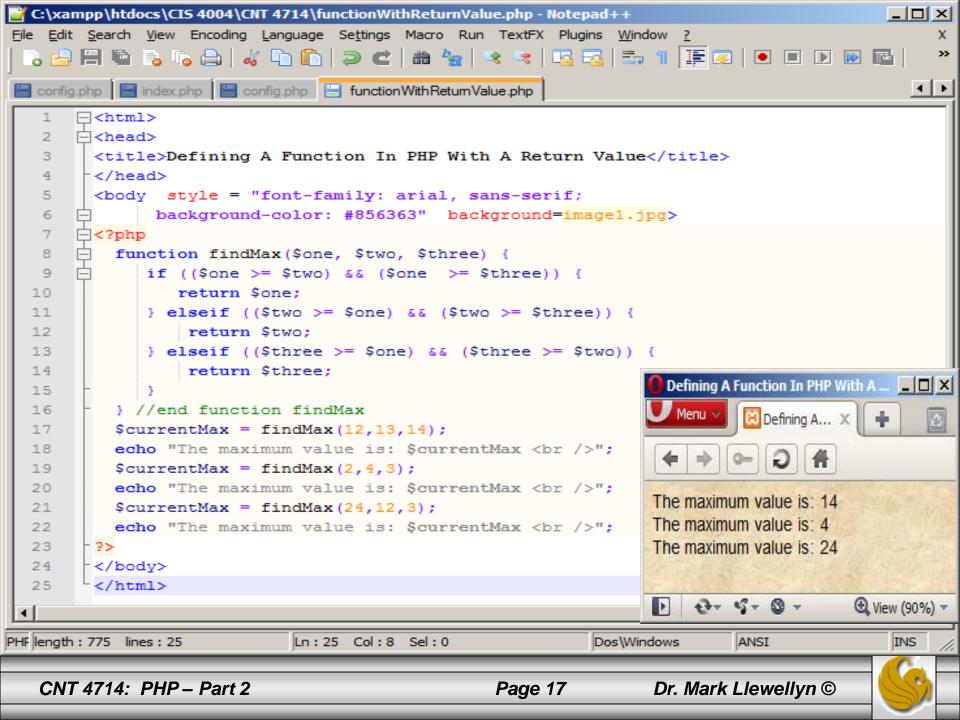
CNT 4714: PHP - Part 2





- 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 provided 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.





- 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:

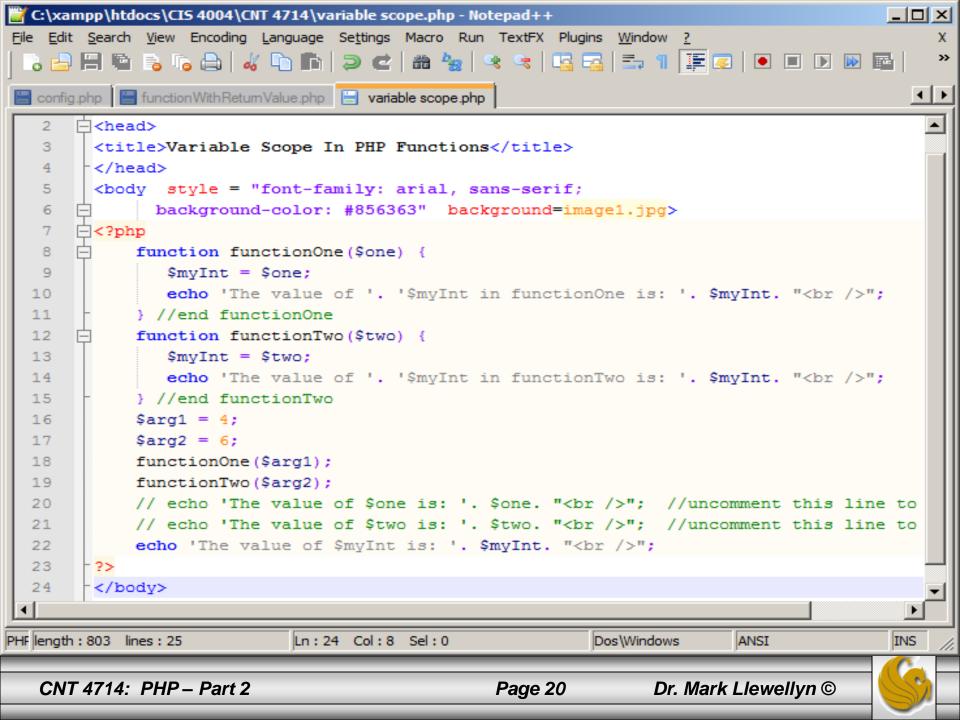
```
return anotherFunction($an_argument);
```

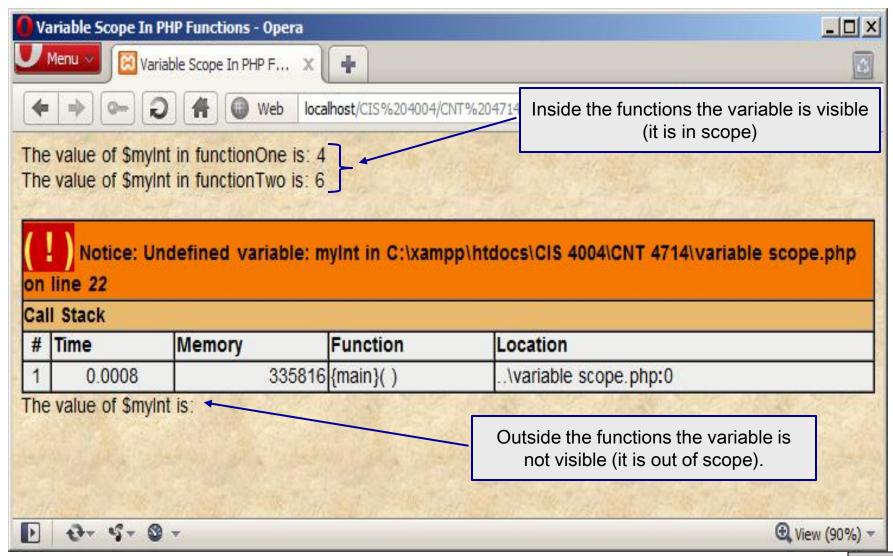


Variable Scope

- 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.



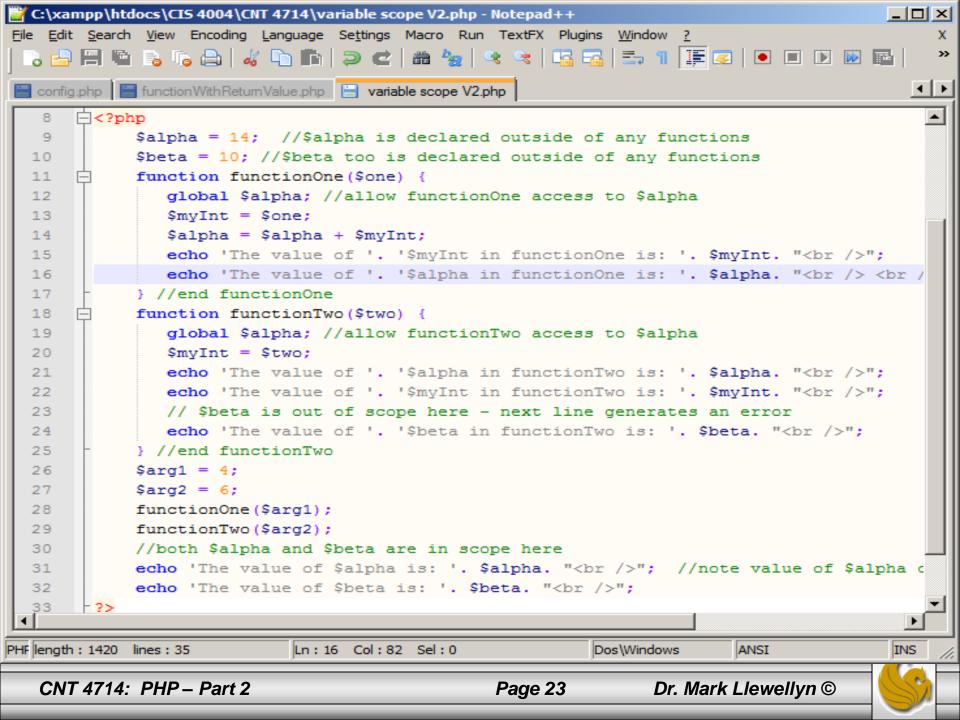




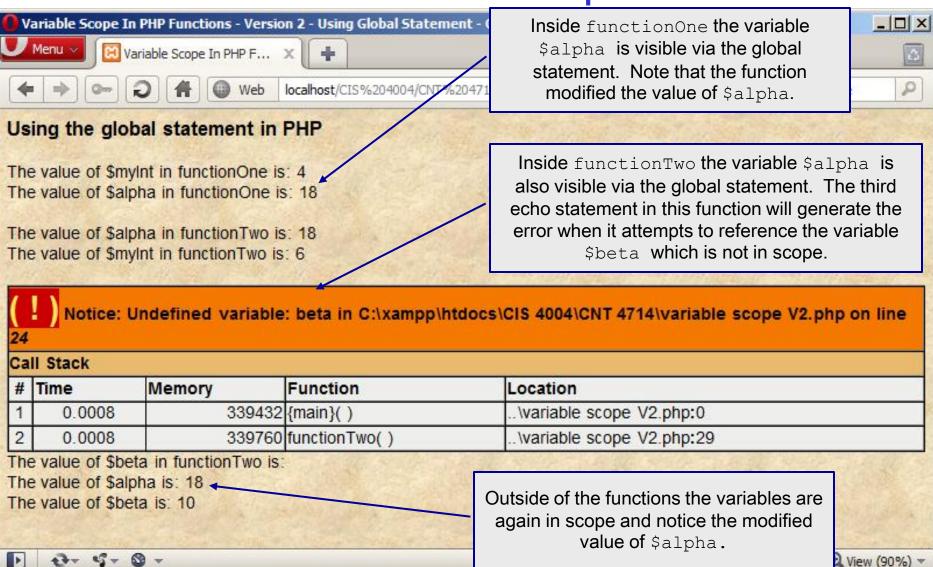


Variable Scope

- 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.



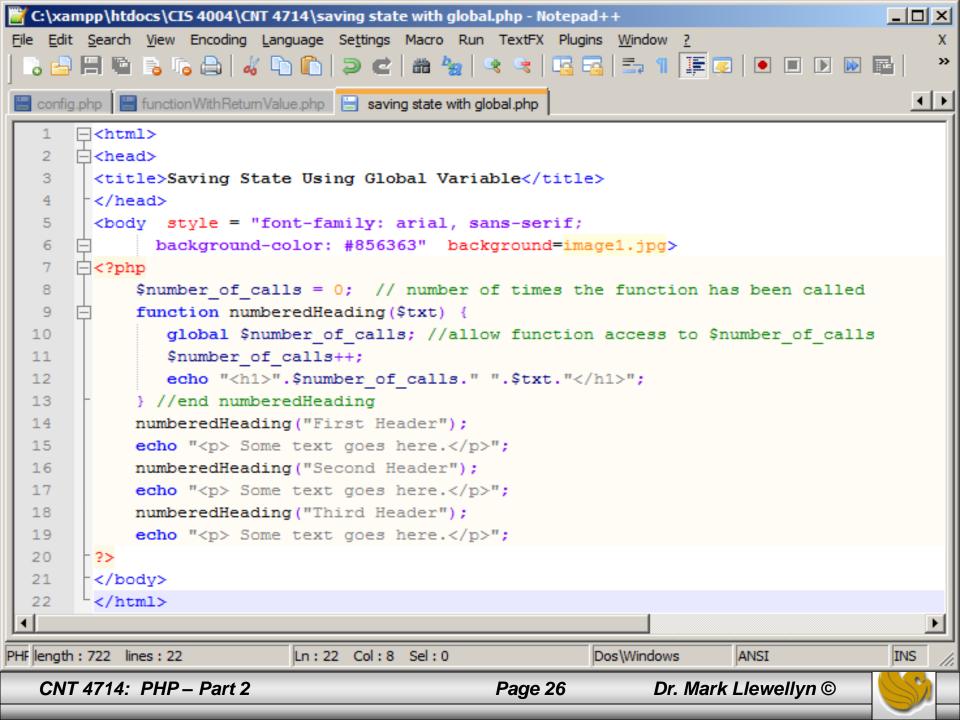
Variable Scope

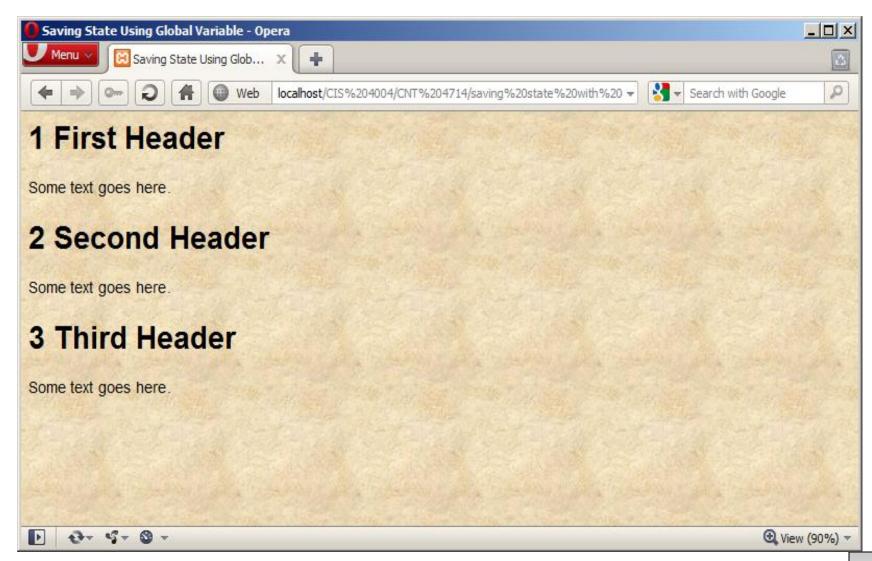




- Local variables within functions have a short but happy life they come into existence when the function is called and die when the execution of the function is finished.
- Occasionally, however, you might want to give a function a rudimentary memory.
- For example, suppose that you'd like a function 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.



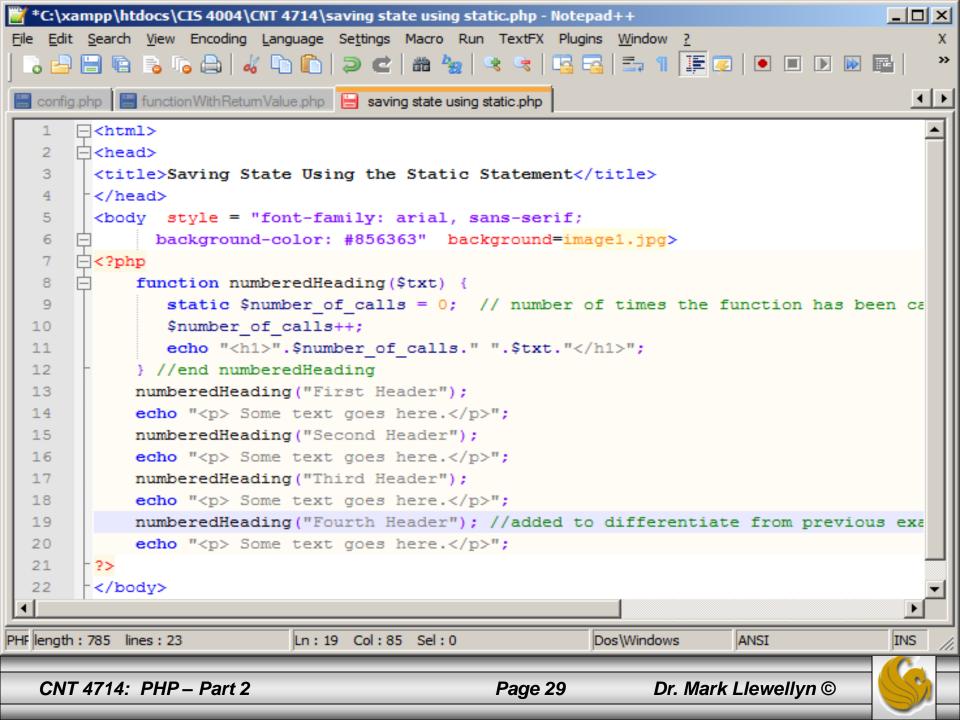


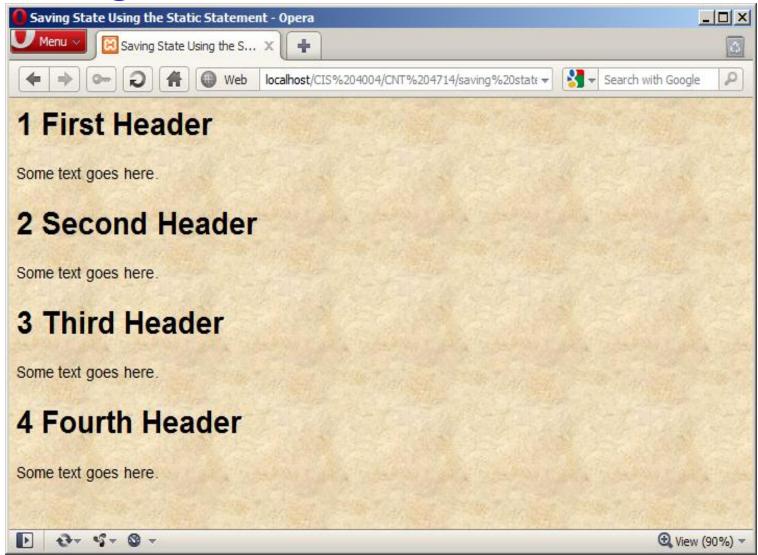




- The previous example illustrated providing a function some "memory" through the use of a global variable.
- This is not a very elegant way to achieve this task. Why?
- Answer: Functions that use the global statement cannot be read as standalone blocks of code. In reading or reusing them, you must look 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.

CNT 4714: PHP - Part 2



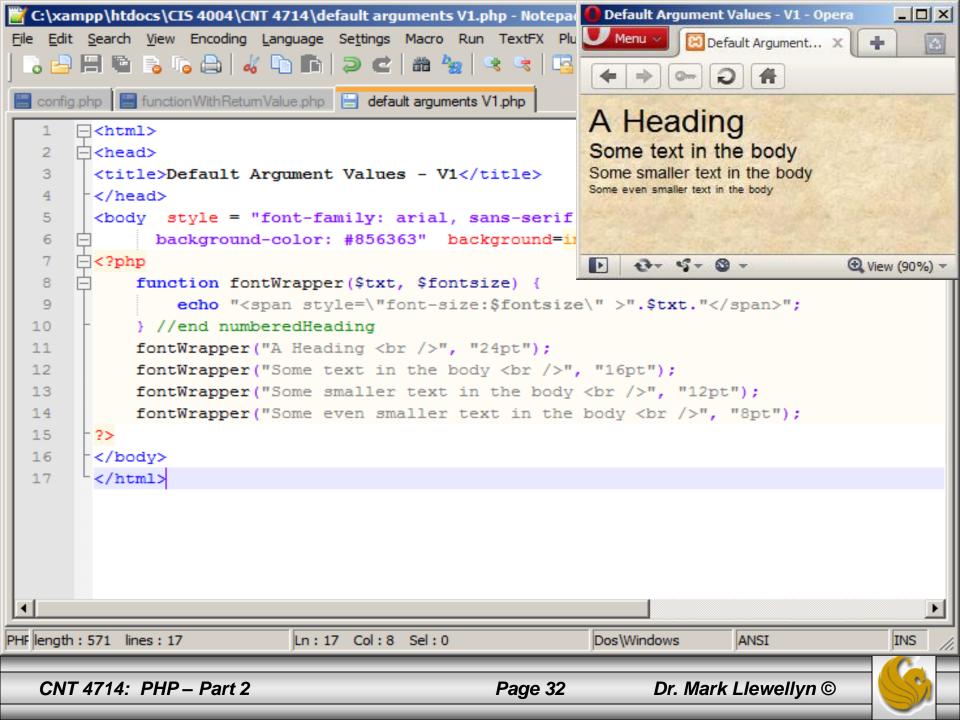




Setting Default Values For Arguments

- 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.





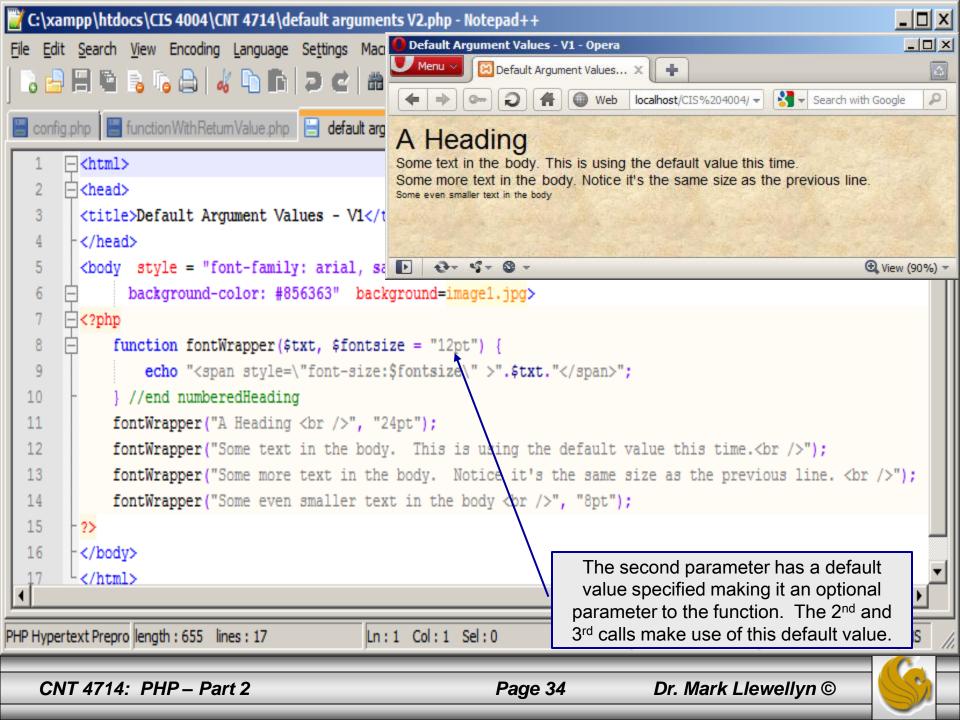
Setting Default Values For Arguments

- 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.





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.

```
-
<head>
      <title>Local Effects Of Function Arguments</title>
     </head>
      <body style = "font-family: arial, sans-serif;</pre>
            background-color: #856363" background=image1.jpg>
     ⊟<?php
                                                                          Local Effects Of Function Argum...
          function add10($num) {
                                                                                   BLocal ... X ♣
               Snum += 10:
10
               echo "In the function the value is: $num <br />";
          } //end add10
11
                                                                         In the function the value is: 20
12
          $original num = 10;
                                                                         The number is: 10
13
          add10($original num);
          echo "The number is: $original num <br/> ";
14
15
     - ?>
16
      </body>
                                                                             D+ 5+ 0+
                                                                                             € View (90%) ¬
      </html>
```

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

