**Class Note 4**
**PHP Oracle Development**
**(Updated 6/3/2015)**

# Arrays

The "class note" is the typical material I would prepare for my face-to-face class. I am sharing the notes with everyone assuming you are in the class.

For the best result of your study, please make sure you do the following:

1. Read the chapter(s) in your textbook, corresponding to the content.
2. Read this class note. Please understand that I will only highlight the important points from your chapters in the textbook. I do not intend to repeat it.
3. Study the "Review Questions" for each week. I intend to combine the chapter content and class notes in the "Review Questions" section. Many of the concepts can be better understood if you fully understand the "Review Questions."

For this chapter, we will focus our attention to ARRAYS. Arrays are very practical tools that will make your programming much more efficient than without. Particularly, since we use PHP to develop database applications, we will have to deal with data tables frequently.

The following illustrates a table listing students in a PHP class:

| Class_ID | First_Name | Last_Name | Time_on_Class | Sense_of_Humor | Grade |
|---|---|---|---|---|---|
| 1 | London | Donovan | 3 | Yes | A |
| 2 | Tim | Howard | 4 | Yes | A |
| 3 | Michael | Bradley | 3.5 | Yes | A |
| 4 | Peter | Liu | 5 | No | B |
| 5 | Tiger | Woods | 1 | Yes | C |
| 6 | Clint | Dempsey | 5 | No | A |

Each record (row) can be treated as an array.  For example, the information on row 1 can be easily stored in computer in a series (as an array), as:

1, London, Donovan, 3, Yes, A.

In other words, an array is a computer structure that holds a series of data.  It is an indispensable tool while programming with a database.  If you look at the above table, you may also tell me that each column can be arranged in an array as well.  Yes, you are absolutely right.

When you write a PHP program, you typically want to be able to do the following:

1. Define the array
2. Manage the array such as identifying or searching your array
3. Manipulate the array such as sorting or merging.

Your textbook provides details for each of the tasks above with extensive examples.  My suggestion is that you need to go through those examples in the chapter and make sure to understand them all.  I will use only a few examples here to illustrate the points.

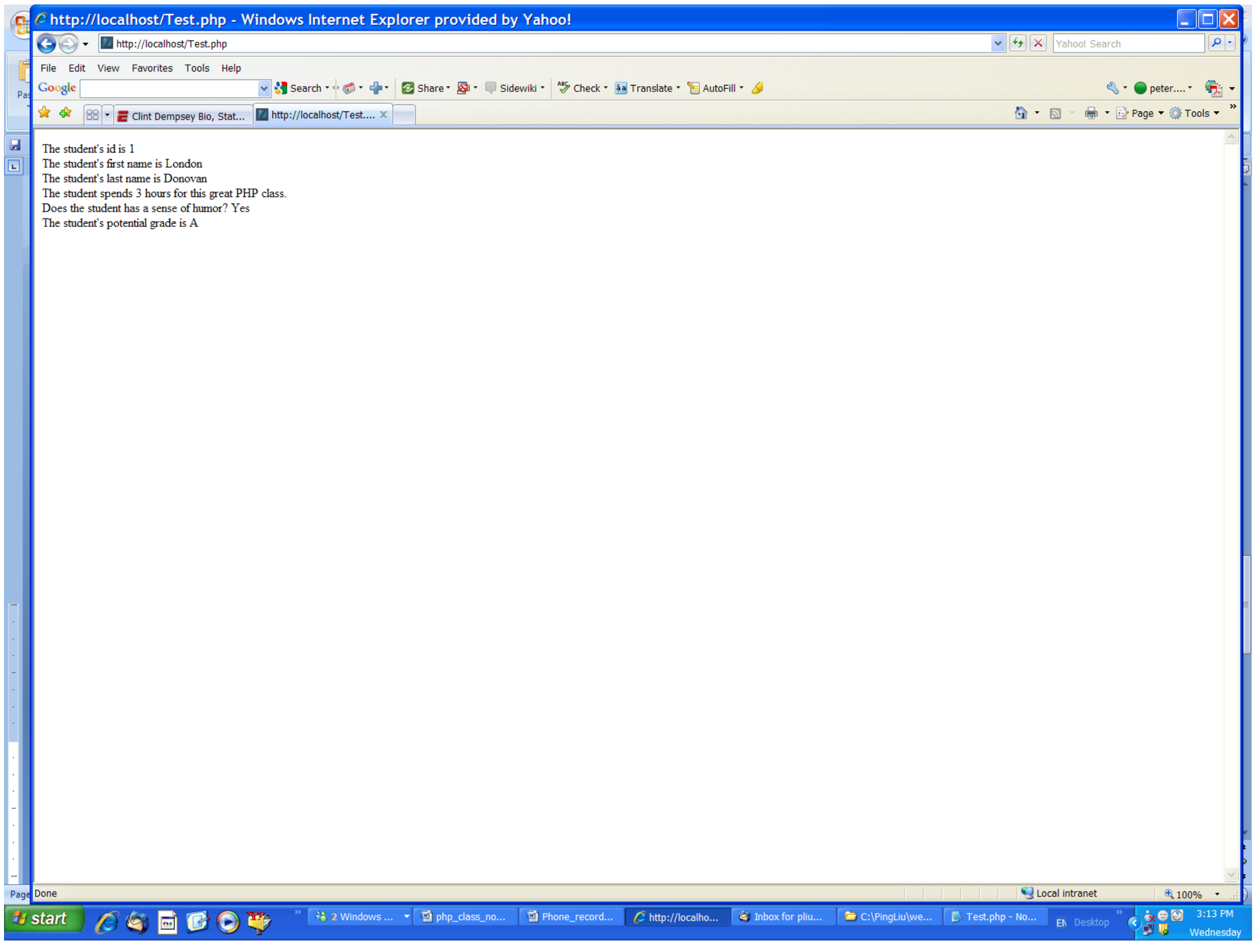
I will discuss some simple issues with array.

1. Defining an Array:

Let us look at the following code in terms of array definition:

```
<?php

  // define the array.

  $student = array("1","London","Donovan","3", "Yes","A");

//print the array one by one to show each value in the series
(array)

print "The student's id is ".$student[0]."</br>";

print "The student's first name is ".$student[1]."</br>";

print "The student's last name is ".$student[2]."</br>";

print "The student spends  ".$student[3]. " hours for this great
PHP class.</br>";

print "Does the student has a sense of humor?
".$student[4]."</br>";

print "The student's potential grade is ".$student[5]."</br>";

?>
```

We defined the array called $student together with its contents (6 components). For example, the third component of the $student array is $student[2]. Its component is “Donovan.” You may be able to see all other components in the array of $student in the same way. In other words, if you run the above code, you will see the following output.


http://localhost/Test.php - Windows Internet Explorer provided by Yahoo!
http://localhost/Test.php
File Edit View Favorites Tools Help
Clint Dempsey Bio, Stat...
http://localhost/Test....
Done
Local intranet
100%

```
The student's id is 1
The student's first name is London
The student's last name is Donovan
The student spends 3 hours for this great PHP class.
Does the student has a sense of humor? Yes
The student's potential grade is A
```

Again, the important point for us to understand is that an array is composed of a series of components. By default, the first component is indexed as “0” instead of “1.” Conversely, the second component is indexed as “1” and so on.

There are other ways to define an array as shown in your textbook.

## 2. FOREACH Loop and Array

One natural challenge is to output the whole content of an array efficiently. For this purpose, the “foreach” you studied last week becomes very handy. That is the reason why I like it so much.

The following code shows you exactly how to accomplish the above task.

```
<?php

  // Define the array.

  $student = array("1","London","Donovan","3", "Yes","A");
  // Declare a starting string variable.

  $output = "Array ( ";


  // Read and add array keys and values to a string.

  foreach ($student as $hashName => $hashValue)

      $output .= " [".$hashName."] => ".$hashValue;


  // Append trailing closed parenthesis.

  $output .= " )";


  // Print the formatted contents.

  print "[".$output."].";

?>
```

If you run the above code, you should be able to see the output as:

[Array ( [0] => 1 [1] => London [2] => Donovan [3] => 3 [4] => Yes [5] => A )].

Now, if I only want to output the content of the array without the index, I can simplify the above program as following:

```
<?php

  // Define the array.

  $student = array("1","London","Donovan","3", "Yes","A");

      $output="";


  // Read and add array keys and values to a string.

  foreach ($student as $hashName => $hashValue)

      $output .= $hashValue."&nbsp";
  // Print the contents only.

print "This row shows the content of the array only. </br> ";

  print $output;


?>
```

Please note that "&nbsp" (a html tag) was added for the purpose of providing a non-blank space between the contents.

With the Foreach loop, you will be able to build multi-dimensional arrays. See your textbook for more details.

3. Array Identification Functions

   While working with arrays, you will need to identify the array. The following functions built in by PHP are very handy for us to use.

   a. count()

Let us do the count() function first. When we say, count() is a PHP function, it means that you may use it (call it) whenever you need it. You do not have to define the function by yourself. See the following code:

```
<?php

  // Define the array.

  $student = array("1","London","Donovan","3", "Yes","A");

// The computer wants to know how many fields are in the array, so we can use count() function.

print "The \$student array has  ".count($student). " fields.";

?>
```

What will be the output for the above code?

b. is_array()

The is_array() function is very useful when you want the computer program to do different things depending upon it is an array or not. The following code illustrate a typical application of the function.

```
<?php
  // Define the array.
  $student = array("1","London","Donovan","3", "Yes","A");


if (is_array($student))


{
      $output="";
  // Read and add array keys and values to a string.
  foreach ($student as $hashName => $hashValue)
      $output .= $hashValue."&nbsp";


  // Print the contents only.
print "This row shows the content of the array only. </br> ";
  print $output;
}
else
{
print "The \$student variable is not an array.";
}
?>
```

If you change the following statement:

```
$student = array("1","London","Donovan","3", "Yes","A");
```

Into:

```
$student = 2;
```

What will be the output? (This will be in the test, believe it or not.)

Please study the “Review Questions.” You will be glad you did study it when you take the “Test” for this course.

We have studied the following:

1. Array definition.
2. Array Managing including in_array function.
3. Array processing/printing using foreach loop.

Now, it is time for you to put them together for a comprehensive application. The example of Array6.php on pages 112-114 will enable you pull all the above concepts together. Your project will be similar to the code as well.

In the above code, the PHP code has some HTML tags. They are pretty straightforward. For example,

<tr> something on a table row </tr>: a tag for a table row.

<td> something in a table cell </td>: a tag for a table cell.

For more details, you may have to refer to the Appendix A in your textbook. Or, you may do some research on HTML code, which is beyond this course.

Study the example and you can make it work for your project.

PS: The above class notes were prepared during the afternoon of June 23, 2010, after the US soccer team scored a victory to move on to the next round. Due to this excitement, many typos or misspelling were in the notes, for your enjoyment.

Go USA.