

CNT 4714: Enterprise Computing Spring 2011

Introduction to PHP – Part 3 - Arrays

Instructor : Dr. Mark Llewellyn
 markl@cs.ucf.edu
 HEC 236, 407-823-2790
 <http://www.cs.ucf.edu/courses/cnt4714/spr2011>

Department of Electrical Engineering and Computer Science
University of Central Florida



Arrays In PHP

- Most of our PHP examples to this point have involved scalar variables (we did see a couple of example in the first section of notes that made use of one of PHP's global associative arrays).
- Scalar variables can only hold a single value at a time. For example, a variable `$color` could hold only a single value such as `red`, at any point in time. The variable could not be used to hold more than one color.
- Arrays are special types of variables that enable you to store as many values as you want.

Note: Although you can technically make an array as large as you'd like, some built-in array handling functions in PHP have an upper limit of 100,000 values. If you are storing more data than this in your arrays and you need to use one of these functions, you will either need to write your own function or split the data into multiple arrays.



Arrays In PHP

- Arrays are indexed, which means that each entry in the array, called an **element**, is made up of a key and a value.
- The **key** is the index position, beginning with 0 and increasing incrementally by 1 with each new element in the array.
- The **value** is whatever value you associate with that position – a string, an integer, or whatever you want.
- In PHP you can think of an array as a filing cabinet and each key/value pair as a file folder. The key is the label written on the tab of the folder, and the value is what is inside. What's inside each folder can vary from folder to folder.



Creating Arrays In PHP

- You can create an array using either the `array()` function or the array operator `[]`.
- The `array()` function is usually used when you want to create a new array and populate it with more than one element, all at the same time.
- The array operator is more often used when you want to create a new array with just one element at the outset or when you want to add to an existing array element.
- The examples on the following couple of pages illustrate creating an array in PHP using these two techniques.





```

1 <html>
2 <head>
3 <title>Creating An Array - Version 1</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=image1.jpg>
7 <?php
8     $rainbow = array("red", "orange", "yellow", "grren", "blue", "indigo", "violet");
9     for ($i=0; $i<=6; $i++) {
10        echo 'Rainbow['. $i.'] color is: '. $rainbow[$i]."<br />";
11    }
12 ?>
13 </body>
14 </html>

```

This version uses the array() function to create the array.



This version uses the array operator [] to create the array.
Note that no index values are specified, PHP will auto number for you

```

1 <html>
2 <head>
3 <title>Creating An Array - Version 2</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=imagem1.jpg>
7 <?php
8     $rainbow[] = "red";
9     $rainbow[] = "orange";
10    $rainbow[] = "yellow";
11    $rainbow[] = "green";
12    $rainbow[] = "blue";
13    $rainbow[] = "indigo";
14    $rainbow[] = "violet";
15    for ($i=0; $i<=6; $i++) {
16        echo 'Rainbow['. $i.'] color is: '. $rainbow[$i]."<br /
17    }
18    ?>
19 </body>
20 </html>

```



This version also uses the array operator [] to create the array.
Note that index values are specified in this case.

```
1 <html>
2 <head>
3 <title>Creating An Array - Version 3</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=image1.jpg>
7 <?php
8     $rainbow[0] = "red";
9     $rainbow[1] = "orange";
10    $rainbow[2] = "yellow";
11    $rainbow[3] = "green";
12    $rainbow[4] = "blue";
13    $rainbow[5] = "indigo";
14    $rainbow[6] = "violet";
15    for ($i=0; $i<=6; $i++) {
16        echo 'Rainbow['. $i.'] color is: '. $rainbow[$i]."<br>";
17    }
18    ?>
19 </body>
20 </html>
```



Creating Arrays In PHP

- As shown in the example on page 6, PHP can automatically index the array for you when you use the [] operator to create the array.
- This is useful in that it eliminates the possibility that you might misnumber the elements. The example on the next page illustrates what happens if you misnumber the elements in an array.




```
1 <html>
2 <head>
3 <title>Creating An Array - Version 4 - misnumbered elements</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6 ..... background-color: #856363" background=image1.jpg>
7 <?php
8     $rainbow[0] = "red";
9     $rainbow[1] = "orange";
10    $rainbow[2] = "yellow";
11    $rainbow[3] = "green";
12    $rainbow[5] = "blue";
13    $rainbow[7] = "indigo";
14    $rainbow[8] = "violet";
15    for ($i=0; $i<=6; $i++) {
16        ..... echo 'Rainbow['. $i.'] color is: '. $rainbow[$i]."<br />";
17    }
18    ?>
19 </body>
20 </html>
```

Misnumbering starts here with no element 4 defined and then 6 too is missed.

Rainbow[0] color is: red
Rainbow[1] color is: orange
Rainbow[2] color is: yellow
Rainbow[3] color is: green

(!) Notice: Undefined offset: 4 in C:\xampp\htdocs\CIS 4004\CNT 4714\array definition V4 misnumbering.php on line 16

Call Stack

#	Time	Memory	Function	Location
1	0.0421	334400	{main}()	..\array definition V4 misnumbering.php:0

Rainbow[4] color is:
Rainbow[5] color is: blue

(!) Notice: Undefined offset: 6 in C:\xampp\htdocs\CIS 4004\CNT 4714\array definition V4 misnumbering.php on line 16

Call Stack

#	Time	Memory	Function	Location
1	0.0421	334400	{main}()	..\array definition V4 misnumbering.php:0

Rainbow[6] color is:



Creating Associative Arrays In PHP

- The arrays we've seen so far have been numerically indexed, meaning that they use an integer index position as the key.
- Associative arrays utilize actual named keys. In PHP, the named keys of an associative array are character strings rather than numerical values. The string value is used to look up or provide a cross-reference to the data value.
- The following example creates an associative array named `$instructor` with three elements.

```
$instructor["CIS 4004"] = "Llewellyn";
```

```
$instructor["CIS 3003"] = "Eisler";
```

```
$instructor["CIS 3360"] = "Guha";
```



Creating Associative Arrays In PHP

- The same array could also be created using the `array()` function instead of the array operator `[]`. This is shown below:

```
$instructor = array ("CIS 4004" => "Llewellyn",  
"CIS 3003" => "Eisler", "CIS 3360" => "Guha");
```

- When using the `array()` function, items are assigned in index/value pairs using the `=>` operator.
- When you want to access an item in an associative array, a syntax similar to that used with sequential (numerically indexed) arrays is employed, however, a string value or variable is used for the index.



Creating Associative Arrays In PHP

- Suppose you wanted to retrieve the instructor for CIS 4004. The following expression would achieve this:

```
$teacher = $instructor["CIS 4004"];
```

- The variable `$teacher` would be assigned the data value associated with “CIS 4004” which would be “Llewellyn”.

Note: You might be tempted to do the following with an associative array, where you are trying to determine which course is taught by the instructor named “Llewellyn”:

```
$course = $instructor["Llewellyn"];
```

Don't do this! An associative array can fetch data values only via the keys and not the values associated with the keys. Therefore, it cannot find an entry in the array with an index value of “Llewellyn” and will return nothing and the value of `$course` will be undefined. The example on the following page illustrates this.



C:\xampp\htdocs\CIS 4004\CNT 4714\associative array - incorrect version.php - Notepad++

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

ArrayScript.ps1 array definition V4 misnumbering.php associative array - incorrect version.php

```

1 <html>
2 <head>
3 <title>Creating An Associative Array - Incorrect Version</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=image1.jpg>
7 <?php
8     $instructor = array( "CIS 4004" => "Llewellyn",
9                         "CIS 3003" => "Eisler",
10                        "CIS 3360" => "Guha" );
11     echo 'The instructor of CIS 4004 is: '. $instructor["CIS 4004"]. "<br />";
12     echo 'The course taught by Eisler is: '. $instructor["Eisler"]. "<br />";
13
14 ?>
15 </body>
16

```

Creating An Associative Array - Incorrect Version - Opera

Menu Creating An Associative ... X

localhost/CIS%204004/CNT%204714/associative? Search with Google

The instructor of CIS 4004 is: Llewellyn

(!) Notice: Undefined index: Eisler in C:\xampp\htdocs\CIS 4004\CNT 4714\associative array - incorrect version.php on line 12

Call Stack

#	Time	Memory	Function	Location
1	0.0346	332432	{main}()	..\associative array - incorrect version.php:0

The course taught by Eisler is:

View (90%)



Using Associative Arrays In PHP

- A common iterative statement used with both sequential and associative arrays is the `foreach` statement.
- The general syntax of the `foreach` statement is:

```
foreach ( arrayname as variable ) {  
    . . . Statements to repeat  
}
```

- The first variable inside the parentheses is the variable name representing the array and the second variable is automatically set to the next array item at each iteration of the loop. An example using a sequential array is shown on the next page and one with an associative array on the following page.





```
1 <html>
2 <head>
3   <title>Foreach statement</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6   background-color: #856363" background=imagel.jpg>
7 <?php
8   $languages = array( "PHP", "C", "Java", "Python", "Ruby", "Pascal", "Fortran");
9   echo "A list of computer languages <br /> <Br />";
10  foreach ($languages as $item) {
11      echo $item . "<br />";
12  }
13  ?>
14 </body>
15 </html>
```



```

1 <html>
2 <head>
3 <title>Foreach statement with an associative array</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=imge1.jpg>
7 <?php
8     $inventory = array( "hard drives" => 10, "printers" => 4, "monitors" => 23);
9     echo "Current Inventory <br /> <br />";
10    foreach ($inventory as $index => $item) {
11        echo $index . ' = ' . $item . "<br />";
12    }
13 <?>
14 </body>
15 </html>

```



Using Associative Arrays In PHP

- Changing values, adding elements, deleting elements, and verifying an element are all among the common operations that you'll need to perform on an associative array.
- Changing an existing value is done through simple assignment. For example, to update the number of monitors in the previous example from 23 to 5, the following statement would be used: `$inventory["monitors"] = 5;`
- To add a new element to an associative array, use the array operator `[]` as in: `$inventory["keyboards"] = 12;`
- Deleting an element from an associative array is done using the `unset()` function.



```

5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=image1.jpg>
7 <?php
8     $inventory = array( "hard drives" => 10, "printers" => 4, "monitors" => 23);
9     echo "Current Inventory <br /> <br />";
10    foreach ($inventory as $index => $item) {
11        echo $index . ' = ' . $item . "<br />";
12    }
13    $inventory["monitors"] = 5;
14    $inventory["keyboards"] = 12;
15    echo "<br /><br /> Current Inventory <br /> <br />";
16    foreach ($inventory as $index => $item) {
17        echo $index . ' = ' . $item . "<br />";
18    }
19    unset($inventory["printers"]);
20    echo "<br /><br /> Current Inventory <br /> <br />";
21    foreach ($inventory as $index => $item) {
22        echo $index . ' = ' . $item . "<br />";
23    }
24    ?>
25 </body>
26 </html>

```

Some operations o...

Menu

Current Inventory

hard drives = 10
printers = 4
monitors = 23

Current Inventory

hard drives = 10
printers = 4
monitors = 5
keyboards = 12

Current Inventory

hard drives = 10
monitors = 5
keyboards = 12

View (90%)

Using Associative Arrays In PHP

- To verify if a particular index exists in an associative array, use the `isset()` function.
- The `isset()` function returns true if index passed as an argument appears in the associative array and false otherwise.
- The example on the following page illustrates using the `isset()` function.



C:\xampp\htdocs\CIS 4004\CNT 4714\using the isset() function.php - Notepad++

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

ArrayScript.ps1 array definition V4 misnumbering.php using the isset() function.php

```
1 <html>
2 <head>
3 <title>Using the isset() function on an associative array</title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=image1.jpg>
7 <?php
8     $inventory = array( "hard drives" => 10, "printers" => 4, "monitors" => 23);
9     echo "Current Inventory <br /> <br />";
10    foreach ($inventory as $index => $item) {
11        echo $index . ' = ' . $item . "<br />";
12    }
13    echo "<br />";
14    if ( isset($inventory["monitors"]) ) {
15        echo "monitors is in the array. <br />";
16    }else { echo "monitors is not in the array. <br />";
17    }
18    if ( isset($inventory["keyboards"]) ) {
19        echo "keyboards is in the array. <br />";
20    }else { echo "keyboards is not in the array. <br />";
21    }
22 >>
23 </body>
```

Using the isset() function on ...

Menu Usin... X

Current Inventory

hard drives = 10
printers = 4
monitors = 23

monitors is in the array.
keyboards is not in the array.

length : 759 lines : 24 Ln : 22 Col : 3 Sel : 0 Dos\Windows ANSI INS View (90%)



Using Associative Arrays In PHP

- As with many things in PHP, associative array indices are case-sensitive. Thus, in the previous example, if the call to the `isset()` function were passed the parameter “Monitors” instead of “monitors” it would return false instead of true.
- See next page.



C:\xampp\htdocs\CIS 4004\CNT 4714\using the isset() function - case sensitivity.php - Notepad++

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

using the isset() function - case sensitivity.php drive_distance.html checkdistance

```
1 <html>
2 <head>
3 <title>Using the isset() function on an associative array
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=image1.jpg>
7 <?php
8     $inventory = array( "hard drives" => 10, "printers" =
9     echo "Current Inventory <br /> <br />";
10    foreach ($inventory as $index => $item) {
11        echo $index . ' = ' . $item . "<br />";
12    }
13    echo "<br />";
14    //associative array indices are case-sensitive - monitors is in array
15    //Monitors is not
16    if ( isset($inventory["Monitors"]) ) {
17        echo "monitors is in the array. <br />";
18    }else { echo "monitors is not in the array. <br />";
19    }
20    if ( isset($inventory["keyboards"]) ) {
21        echo "keyboards is in the array. <br />";
22    }else { echo "keyboards is not in the array. <br />";
23    }
24    ?>
25 </body>
```

length : 851 lines : 26 Ln : 15 Col : 22 Sel : 0 Dos\Windows ANSI INS

Using the isset() function on an ass...
Menu
View (100%)

Current Inventory
hard drives = 10
printers = 4
monitors = 23
monitors is not in the array.
keyboards is not in the array.



Sorting Associative Arrays In PHP

- PHP has a special set of functions for sorting associative arrays.
- The `asort()` function sorts an associative array and maintains the relationship between the indices and the values. The sort is based upon the values in the associative array passed as an argument to the function. The sort order is ascending based on the value. The `arsort()` function sorts in descending order based on value.
- The `ksort()` function is similar to the `asort()` function but it sorts an associative array using the indices (in ascending order) as the sort field. The `krsort()` function sorts in descending order using the indices.
- These various sort functions are shown on the next few pages.





```
1 <html>
2 <head>
3     <title> Using the asort() function </title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=imagem1.jpg>
7 <?php
8     $cities['Boston'] = 1302;
9     $cities['Dallas'] = 1093;
10    $cities['Toronto'] = 1282;
11    $cities['Chicago'] = 1154;
12    $cities['Los Angeles'] = 2512;
13    $cities['San Francisco'] = 2825;
14    $cities['Washington'] = 853;
15    $cities['Miami'] = 235;
16    $cities['Pittsburgh'] = 972;
17    $cities['Tampa'] = 85;
18
19    asort($cities);
20    print("Cities sorted by distance from Orlando. <br /><br />");
21    foreach ($cities as $index => $value) {
22        print (" $index = $value <br />");
23    }
24    ?>
25 </body>
```

length : 650 lines : 28

Ln : 25 Col : 8 Sel : 0

UNIX

ANSI

INS

Using asort()

Using the asort() function - Opera

Cities sorted by distance from Orlando.

Tampa = 85
Miami = 235
Washington = 853
Pittsburgh = 972
Dallas = 1093
Chicago = 1154
Toronto = 1282
Boston = 1302
Los Angeles = 2512
San Francisco = 2825

View (90%)





Using arsort()

```

1 <html>
2 <head>
3     <title> Using the arsort() function </title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=image1.jpg>
7 <?php
8     $cities['Boston'] = 1302;
9     $cities['Dallas'] = 1093;
10    $cities['Toronto'] = 1282;
11    $cities['Chicago'] = 1154;
12    $cities['Los Angeles'] = 2512;
13    $cities['San Francisco'] = 2825;
14    $cities['Washington'] = 853;
15    $cities['Miami'] = 235;
16    $cities['Pittsburgh'] = 972;
17    $cities['Tampa'] = 85;
18
19    arsort($cities);
20    print("Cities sorted by distance from Orlando. <br />
21    foreach ($cities as $index => $value) {
22        print (" $index = $value <br />");
23    }
24    ?>
25 </body>
26 </html>
27
28

```

Using the arsort() function - Opera

Menu Using the arsort... X



Cities sorted by distance from Orlando.

```

San Francisco = 2825
Los Angeles = 2512
Boston = 1302
Toronto = 1282
Chicago = 1154
Dallas = 1093
Pittsburgh = 972
Washington = 853
Miami = 235
Tampa = 85

```

View (90%)



Using ksort()

```
1 <html>
2 <head>
3     <title> Using the ksort() function </title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=image1.jpg>
7 <?php
8     $cities['Boston'] = 1302;
9     $cities['Dallas'] = 1093;
10    $cities['Toronto'] = 1282;
11    $cities['Chicago'] = 1154;
12    $cities['Los Angeles'] = 2512;
13    $cities['San Francisco'] = 2825;
14    $cities['Washington'] = 853;
15    $cities['Miami'] = 235;
16    $cities['Pittsburgh'] = 972;
17    $cities['Tampa'] = 85;
18
19    ksort($cities);
20    print("Cities sorted by distance from Orlando. <br /><br />");
21    foreach ($cities as $index => $value) {
22        print (" $index = $value <br />");
23    }
24    ?>
25 </body>
```



C:\xampp\htdocs\CIS 4004\CNT 4714\using the krsort() function.php - Notepad++

File Edit Search View Encoding Language Settings Macro Run TextFX Plugins

using the krsort() function.php drivehashadd.html hashadd.php multidimens

Using krsort()

```
1 <html>
2 <head>
3     <title> Using the krsort() function </title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=image1.
7 <?php
8     $cities['Boston'] = 1302;
9     $cities['Dallas'] = 1093;
10    $cities['Toronto'] = 1282;
11    $cities['Chicago'] = 1154;
12    $cities['Los Angeles'] = 2512;
13    $cities['San Francisco'] = 2825;
14    $cities['Washington']= 853;
15    $cities['Miami'] = 235;
16    $cities['Pittsburgh'] = 972;
17    $cities['Tampa'] = 85;
18
19    krsort($cities);
20    print("Cities sorted by distance from Orlando. <
21    foreach ($cities as $index => $value) {
22        print (" $index = $value <br />");
23    }
24    ?>
25 </body>
26 </html>
27
```

Using the krsort() function - Opera

Cities sorted by distance from Orlando.

- Washington = 853
- Toronto = 1282
- Tampa = 85
- San Francisco = 2825
- Pittsburgh = 972
- Miami = 235
- Los Angeles = 2512
- Dallas = 1093
- Chicago = 1154
- Boston = 1302

length : 652 lines : 28 Ln : 19 Col : 7 Sel : 0 UNIX ANSI INS



Using Multidimensional Arrays In PHP

- Some data are best represented by creating a list of lists (a multidimensional array).
- Consider the following table listing the inventory for a hardware store:

Part Number	Part Name	Count	Price
AC1000	Hammer	122	28.50
AC1001	Wrench	25	14.00
AC1002	Saw	18	25.00
AC1003	Screwdriver	34	4.50

- The example on the next page represents this data in a two-dimensional associative array.




```
C:\xampp\htdocs\CIS 4004\CNT 4714\drive_inventory.php - Notepad++
File Edit Search View Encoding Language Settings Macro Run TextFX Plugins Window ?
hashadd.php multidimensional associative array.php drive_inventory.php show_inventory.php
1 <html>
2 <head>
3     <title> Hardware Inventory </title>
4 </head>
5 <body style = "font-family: arial, sans-serif;
6     background-color: #856363" background=imagem1.jpg>
7
8     <form action="show_inventory.php" method = "post">
9     <font size=4 colr ="blue">Mark's Hardware Inventory Information </font> <br />
10    <br />Select part number for more information </font> <br />
11    <?php
12        $Inventory = array( 'AC1000', 'AC1001', 'AC1002', 'AC1003' );
13        foreach ( $Inventory as $item ) {
14            print "<input type=radio name=\"id\" value=$item > $item ";
15        }
16        print '<br /><input type=submit value="Submit">';
17        print '<input type=reset value="Erase ">';
18        print '</form> </body></html>';
19    ?>
20 </body>
21 </html>
22
```

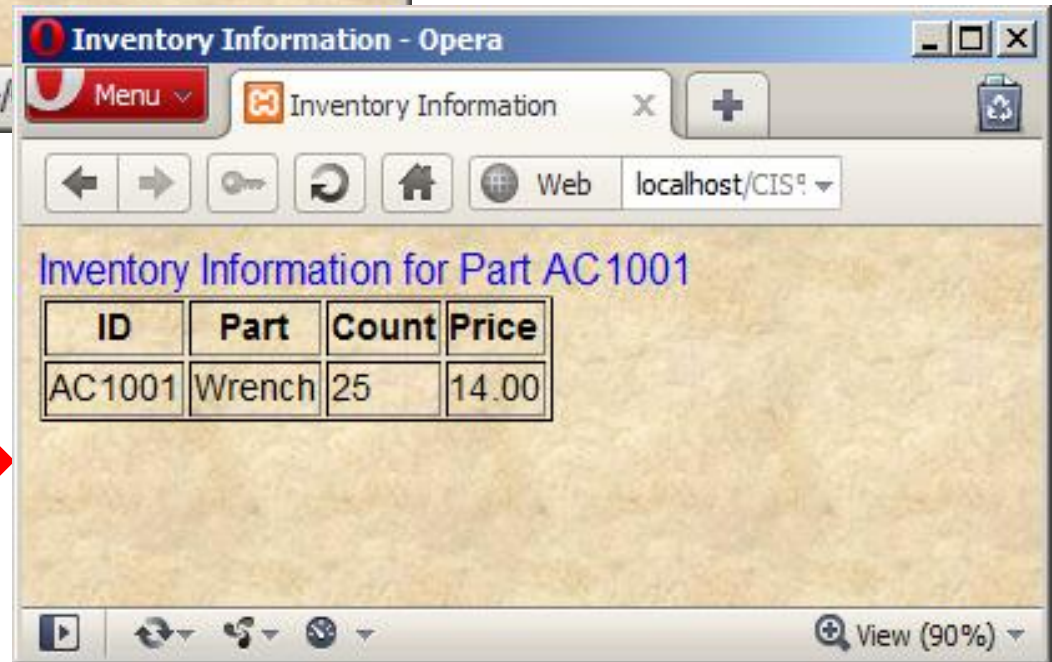
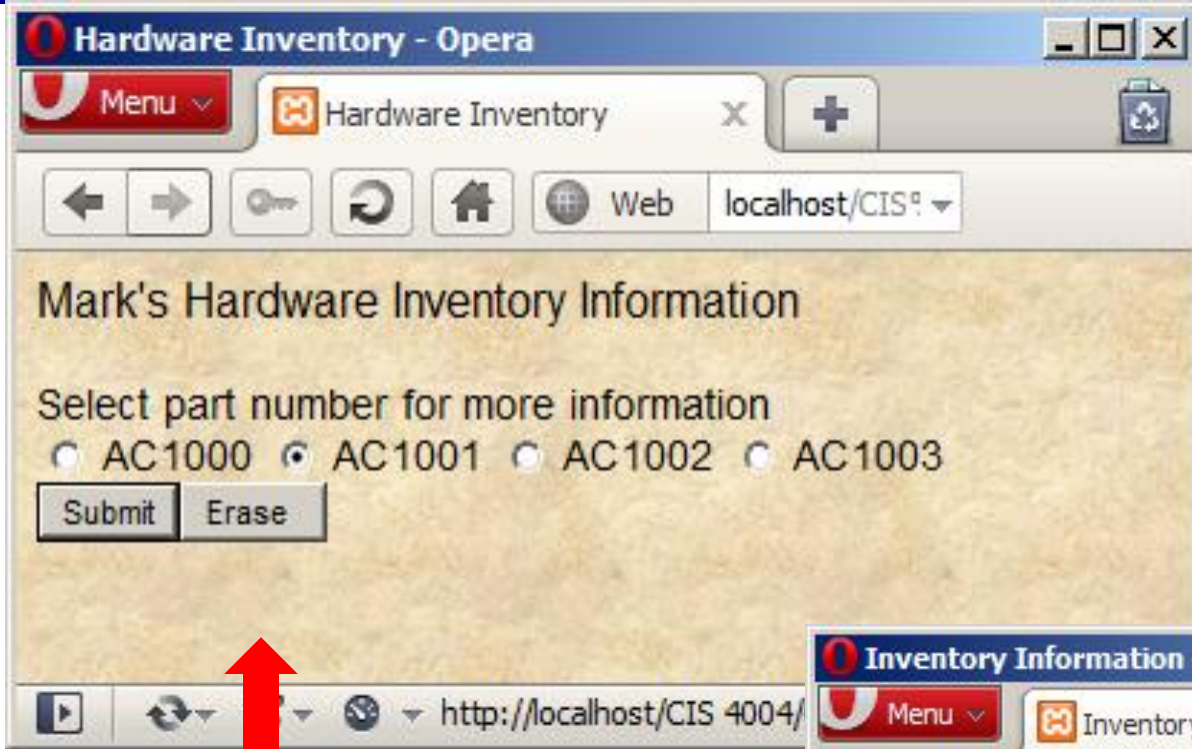
XHTML Front-end
Provides a set of radio buttons for user to select the part they'd like to see more information about.



```
C:\xampp\htdocs\CIS 4004\CNT 4714\show_inventory.php - Notepad++
File Edit Search View Encoding Language Settings Macro Run TextFX Plugins Window ?
hashadd.php multidimensional associative array.php drive_inventory.php show_inventory.php
6 background-color: #856363" background=image1.jpg>
7 <?php
8 $inventory = array (
9     'AC1000'=>array('Part'=>'Hammer','Count'=>122,
10                    'Price'=> 28.50 ),
11     'AC1001' => array('Part' =>'Wrench','Count' =>25,
12                    'Price'=>14.00 ),
13     'AC1002'=>array('Part' =>'Handsaw','Count' =>18,
14                    'Price'=>25.00 ),
15     'AC1003'=>array('Part' =>'Screwdrivers','Count'=>34,
16                    'Price'=>4.50)
17 );
18 $id = $_POST["id"];
19 if (isset($inventory[$id])){
20     print '<font size=4 color="blue"> ';
21     print "Inventory Information for Part $id </font>";
22     print '<table border=1> <th> ID <th> Part <th> Count <th> Price ';
23     print "<tr> <td> $id </td>";
24         print "<td> {$inventory[$id]['Part']} </td>";
25         print "<td> {$inventory[$id]['Count']} </td>";
26         print("<td>");
27         printf( "%4.2f", $inventory[$id]['Price'] );
28         print("</td></tr>");
29     } else {
30         print "Illegal part ID = $id ";
31     }
32 ?>
33 </body>
```

PHP script to find the correct entry in the associative array based on the user's selection, then display the associative array entries for that item.





1. User selects a part number

2. PHP script displays part details.

