Practical No. 8 – Program to PHP Enumerated array, php associative arrays, array iteration, php multi-dimensional arrays, arrays function.
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Code:

```php
<?php
// Enumerated Array
$colors = array('Red', 'Green', 'Blue');

// Associative Array
$person = array(
    'first_name' => 'John',
    'last_name' => 'Doe',
    'age' => 30
);

// Array Iteration
echo "Enumerated Array Elements:\n";
foreach ($colors as $color) {
    echo $color . "\n";
}
echo "<br>";
echo "\nAssociative Array Elements:\n";
foreach ($person as $key => $value) {
    echo $key . ": " . $value . "\n";
}

// Multi-Dimensional Array
$employees = array(
    array('first_name' => 'Alice', 'last_name' => 'Smith', 'age' => 25),
    array('first_name' => 'Bob', 'last_name' => 'Johnson', 'age' => 32),
    array('first_name' => 'Charlie', 'last_name' => 'Brown', 'age' => 28)
);
echo "<br>";
echo "\nMulti-Dimensional Array Elements:\n";
foreach ($employees as $employee) {
    echo "Name: " . $employee['first_name'] . " " . $employee['last_name'] . ", Age: " . $employee['age'] .
"\n";
}

// Array Functions
echo "<br>";
echo "\nArray Functions:\n";
echo "<br>";


// Count
$numbers = array(1, 2, 3, 4, 5);
```

```php
echo "Count of numbers array: " . count($numbers) . "\n";

// Sorting
$fruits = array('Apple', 'Banana', 'Orange', 'Cherry');
sort($fruits);
echo "<br>";
echo "Sorted Fruits: " . implode(', ', $fruits) . "\n";

// Pushing and Popping
$stack = array();
array_push($stack, 'Item1');
array_push($stack, 'Item2');
array_push($stack, 'Item3');
$lastItem = array_pop($stack);
echo "<br>";
echo "Popped Item: " . $lastItem . "\n";

// Searching
$names = array('Alice', 'Bob', 'Charlie', 'David');
$searchName = 'Bob';
if (in_array($searchName, $names)) {
   echo "<br>";
   echo "Found $searchName in the array.\n";
} else {
   echo "$searchName not found in the array.\n";
}
?>

<!-- Associative arrays -->
<!DOCTYPE html>
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">
<head>
   <title>Associative Arrays with print_r()</title>
   <link rel="stylesheet" type="text/css" href="common.css" />
</head>
<body>
   <h1>Outputting Arrays with print_r()</h1>
   <?php
   $authors = array("Steinbeck", "Kafka", "Tolkien", "Dickens");
   $myBook = array(
      "title" => "The Grapes of Wrath",
      "author" => "John Steinbeck",
      "pubYear" => 1939
   );
   echo '<h2>$authors:</h2><pre>';
   print_r($authors);
   echo '</pre><h2>$myBook:</h2><pre>';
   print_r($myBook);
```

```php
    echo '</pre>';
  ?>
</body>
</html>

<!--Working with multidimensional array-->
<!DOCTYPE html>
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">
<head>
   <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
   <title>Looping Through a Two-Dimensional Array</title>
   <link rel="stylesheet" type="text/css" href="common.css" />
</head>
<body>
   <h1>Looping Through a Two-Dimensional Array</h1>
   <?php
   $myBooks = array(
     array(
       "title" => "The Grapes of Wrath",
       "author" => "John Steinbeck",
       "pubYear" => 1939
     ),
     array(
       "title" => "The Trial",
       "author" => "Franz Kafka",
       "pubYear" => 1925
     ),
     array(
       "title" => "The Hobbit",
       "author" => "J. R. R. Tolkien",
       "pubYear" => 1937
     ),
     array(
       "title" => "A Tale of Two Cities",
       "author" => "Charles Dickens",
       "pubYear" => 1859
     ),
   );

   $bookNum = 0;
   foreach ($myBooks as $book) {
     $bookNum++;
     echo "<h2>Book #$bookNum:</h2>";
     echo "<dl>";
     foreach ($book as $key => $value) {
       echo "<dt>$key</dt><dd>$value</dd>";
     }
     echo "</dl>";
```

```php
      }
   ?>
</body>
</html>

<?php
// Original array
$fruits = array('Apple', 'Banana', 'Cherry', 'Orange', 'Grapes');

// Using array_splice() to insert and remove elements
array_splice($fruits, 2, 1, array('Mango', 'Pineapple')); // Replace 'Cherry' with 'Mango' and 'Pineapple'

// Using array_unshift() to add elements to the beginning
array_unshift($fruits, 'Strawberry', 'Kiwi');

// Using array_shift() to remove the first element
$firstFruit = array_shift($fruits);

// Using array_push() to add elements to the end
array_push($fruits, 'Peach', 'Lemon');

// Using array_pop() to remove the last element
$lastFruit = array_pop($fruits);

// Display the modified array and removed elements
echo "Modified Array:\n";
print_r($fruits);
echo "<br>";
echo "Removed First Element: $firstFruit\n";
echo "<br>";
echo "Removed Last Element: $lastFruit\n";
?>

<?php
// Enumerated Array
$fruits = array('Apple', 'Banana', 'Cherry', 'Orange', 'Grapes');

// Associative Array
$student = array(
   'first_name' => 'John',
   'last_name' => 'Doe',
   'age' => 20,
   'courses' => array('Math', 'History', 'English')
);

// Array Iteration
echo "<br>";
echo "Enumerated Array Elements:\n";
```

```php
foreach ($fruits as $fruit) {
    echo $fruit . "\n";
}
echo "<br>";
echo "\nAssociative Array Elements:\n";
foreach ($student as $key => $value) {
    if (is_array($value)) {
        echo $key . ": " . implode(', ', $value) . "\n";
    } else {
        echo $key . ": " . $value . "\n";
    }
}

// Multi-Dimensional Array
$employees = array(
    array('first_name' => 'Alice', 'last_name' => 'Smith', 'age' => 25),
    array('first_name' => 'Bob', 'last_name' => 'Johnson', 'age' => 32),
    array('first_name' => 'Charlie', 'last_name' => 'Brown', 'age' => 28)
);
echo "<br>";
echo "\nMulti-Dimensional Array Elements:\n";
foreach ($employees as $employee) {
    echo "Name: " . $employee['first_name'] . " " . $employee['last_name'] . ", Age: " . $employee['age'] .
"\n";
}

// Array Functions
echo "<br>";
echo "\nArray Functions:\n";

// Count
echo "<br>";
echo "Count of fruits array: " . count($fruits) . "\n";

// Sorting
rsort($fruits);
echo "<br>";
echo "Reverse Sorted Fruits: " . implode(', ', $fruits) . "\n";

// Pushing and Popping
$stack = array();
array_push($stack, 'Item1');
array_push($stack, 'Item2');
array_push($stack, 'Item3');
$lastItem = array_pop($stack);
echo "<br>";
echo "Popped Item: " . $lastItem . "\n";
```
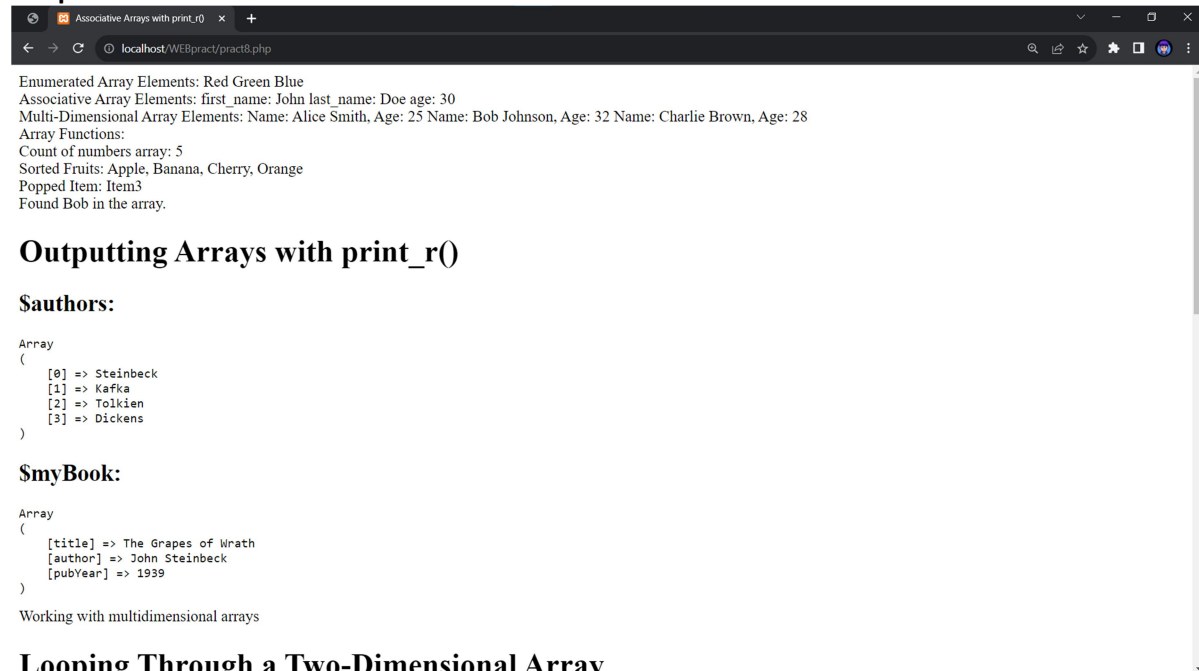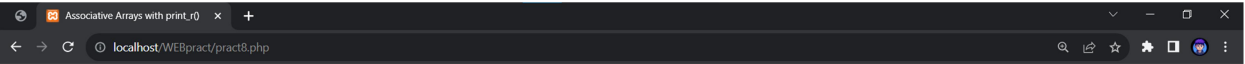
```php
// Searching
$searchName = 'Alice';
if (in_array($searchName, array_column($employees, 'first_name'))) {
    echo "<br>";
    echo "Found $searchName in the employees list.\n";
} else {
    echo "$searchName not found in the employees list.\n";
}

// Merging Arrays
$firstArray = array('a' => 1, 'b' => 2, 'c' => 3);
$secondArray = array('d' => 4, 'e' => 5);
$mergedArray = array_merge($firstArray, $secondArray);
print_r($mergedArray);
?>
```

Output:

Enumerated Array Elements: Red Green Blue
Associative Array Elements: first_name: John last_name: Doe age: 30
Multi-Dimensional Array Elements: Name: Alice Smith, Age: 25 Name: Bob Johnson, Age: 32 Name: Charlie Brown, Age: 28
Array Functions:
Count of numbers array: 5
Sorted Fruits: Apple, Banana, Cherry, Orange
Popped Item: Item3
Found Bob in the array.

Outputting Arrays with print_r()

$authors:

```
Array
(
    [0] => Steinbeck
    [1] => Kafka
    [2] => Tolkien
    [3] => Dickens
)
```

$myBook:

```
Array
(
    [title] => The Grapes of Wrath
    [author] => John Steinbeck
    [pubYear] => 1939
)
```

Working with multidimensional arrays

Looping Through a Two-Dimensional Array

Looping Through a Two-Dimensional Array

Book #1:

title
    The Grapes of Wrath
author
    John Steinbeck
pubYear
    1939

Book #2:

title
    The Trial
author
    Franz Kafka
pubYear
    1925

Book #3:

title
    The Hobbit
author
    J. R. R. Tolkien
pubYear
    1937

Book #4:

Franz Kafka
pubYear
    1925

Book #3:

title
    The Hobbit
author
    J. R. R. Tolkien
pubYear
    1937

Book #4:

title
    A Tale of Two Cities
author
    Charles Dickens
pubYear
    1859

Modified Array: Array ([0] => Kiwi [1] => Apple [2] => Banana [3] => Mango [4] => Pineapple [5] => Orange [6] => Grapes [7] => Peach)
Removed First Element: Strawberry
Removed Last Element: Lemon
Enumerated Array Elements: Apple Banana Cherry Orange Grapes
Associative Array Elements: first_name: John last_name: Doe age: 20 courses: Math, History, English
Multi-Dimensional Array Elements: Name: Alice Smith, Age: 25 Name: Bob Johnson, Age: 32 Name: Charlie Brown, Age: 28
Array Functions:
Count of fruits array: 5
Reverse Sorted Fruits: Orange, Grapes, Cherry, Banana, Apple
Popped Item: Item3
Found Alice in the employees list. Array ([a] => 1 [b] => 2 [c] => 3 [d] => 4 [e] => 5)