Lecture No: 2
Topic: Functions and Control Structures

Objectives:
In this chapter, you will:

- Study how to use functions to organize your PHP code
- Learn about variable scope
- Make decisions using if statements, if...else statements, and switch statements
- Repeatedly execute while statements, do...while statements, for, and foreach statements
- Learn about include and require statements

Defining Functions

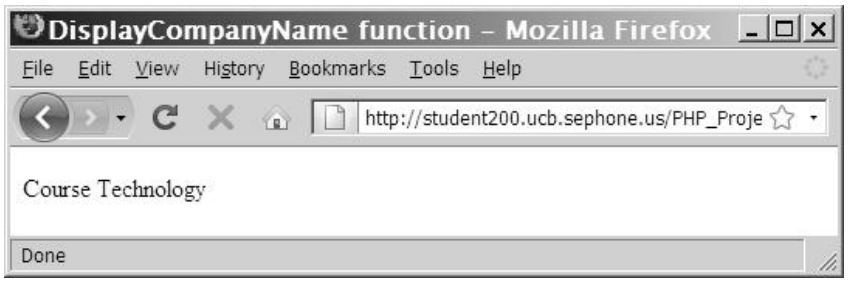
- Functions are groups of statements that you can execute as a single unit
- Function definitions are the lines of code that make up a function
- The syntax for defining a function is:

```
<?php
function name_of_function(parameters) {
    statements;
}
?>
```

- Functions, like all PHP code, must be contained within <?php ... ?> tags
- A parameter is a variable that is passed to a function when it is called
- Parameters are placed within the parentheses that follow the function name
- Functions do not have to contain parameters
- The set of curly braces (called function braces) contain the function statements

- Function statements do the actual work of the function and must be contained within the function braces

```
function displayCompanyName($Company1, $Company2, $Company3) {
                    echo "<p>$Company1</p>";
                    echo "<p>$Company2</p>";
                    echo "<p>$Company3</p>";
}
```



Calling Functions

```
        function
displayCompanyName($CompanyName) {
                    echo "<p>$CompanyName</p>";
        }
        displayCompanyName("Course Technology");
```

Returning Values

- A return statement returns a value to the statement that called the function
- Not all functions return values

```
function averageNumbers($a, $b, $c) {
```

REFERENCE: PHP Programming with MySQL 2nd Edition

```
    $SumOfNumbers = $a + $b + $c;
    $Result = $SumOfNumbers / 3;
    return $Result;
}
```

- You can pass a function parameter by value or by reference
- A function parameter that is passed by value is a local copy of the variable.
- A function parameter that is passed by reference is a reference to the original variable.

Understanding Variable Scope

- **Variable scope** is where in your program a declared variable can be used
- A variable's scope can be either global or local
- A **global variable** is one that is declared outside a function and is available to all parts of your program
- A **local variable** is declared inside a function and is only available within the function in which it is declared

The global Keyword

- In PHP, you must declare a global variable with the global keyword inside a function definition to make the variable available within the scope of that function

```
<?php
$GlobalVariable = "Global variable";
function scopeExample() {
global $GlobalVariable;
echo "<p>$GlobalVariable</p>";
}
scopeExample();
?>
```

Making Decisions

- **Decision making** or **flow control** is the process of determining the order in which statements execute in a program
- The special types of PHP statements used for making decisions are called **decision-making statements** or **decision-making structures**

if Statements

- Used to execute specific programming code if the evaluation of a conditional expression returns a value of TRUE
- The syntax for a simple if statement is:

    if (*conditional expression*)
        statement;

- Contains three parts:
  - the keyword if
  - a conditional expression enclosed within parentheses
  - the executable statements
- A **command block** is a group of statements contained within a set of braces
- Each command block must have an opening brace ({) and a closing brace (})

```
$ExampleVar = 5;
if ($ExampleVar == 5) {   // condition evaluates to 'TRUE'
```

REFERENCE: PHP Programming with MySQL 2nd Edition

```
    echo " <p>The condition evaluates to true.</p> ";
    echo '<p>$ExampleVar is equal to ',
    " $ExampleVar.</p> ";
            echo " <p>Each of these lines will be printed.</p> ";
}
echo " <p>This statement always executes after the if
statement.</p> ";
```

if...else Statements

- An if statement that includes an else clause is called an **if...else statement**
- An else clause executes when the condition in an if...else statement evaluates to FALSE
- The syntax for an if...else statement is:

if (*conditional expression*)
statement;
else
statement;

- An if statement can be constructed without the else clause
- The else clause can only be used with an if statement

```
$Today = " Tuesday ";
if ($Today == " Monday ")
        echo " <p>Today is Monday</p> ";
 else
        echo " <p>Today is not Monday</p> ";
```

Nested if and if...else Statements

- When one decision-making statement is contained within another decision-making statement, they are referred to as nested **decision-making structures**

```
if ($SalesTotal >= 50)
        if ($SalesTotal <= 100)
                echo " <p>The sales total is between 50 and 100, inclusive.</p> ";
```

switch Statements

- Control program flow by executing a specific set of statements depending on the value of an expression
- Compare the value of an expression to a value contained within a special statement called a **case label**
- A **case label** is a specific value that contains one or more statements that execute if the value of the case label matches the value of the switch statement's expression
- Consist of the following components:
    - The switch keyword
    - An expression
    - An opening brace
    - One or more case labels
    - The executable statements
    - The break keyword
    - A default label
    - A closing brace

REFERENCE: PHP Programming with MySQL 2nd Edition

- The syntax for the switch statement is:

```
switch (expression) {
case label:
        statement(s);
        break;
case label:
        statement(s);
        break;
...
default:
        statement(s);
        break;
}
```

- A case label consists of:
  - The keyword **case**
  - A literal value or variable name
  - A colon (:)
- A case label can be followed by a single statement or multiple statements
- Multiple statements for a case label do not need to be enclosed within a command block
- The **default label** contains statements that execute when the value returned by the switch statement expression does not match a case label
- A default label consists of the keyword default followed by a colon (:)

Repeating Code

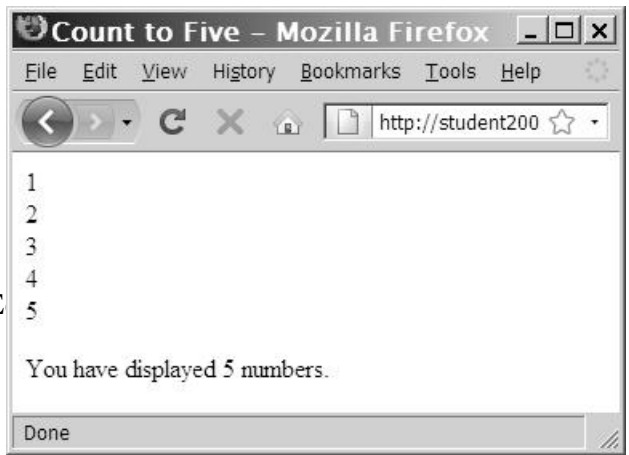
- A **loop statement** is a control structure that repeatedly executes a statement or a series of statements while a specific condition is TRUE or until a specific condition becomes TRUE
- There are four types of loop statements:
  - while statements
  - do...while statements
  - for statements
  - foreach statements

while Statements

- Tests the condition prior to executing the series of statements at each iteration of the loop
- The syntax for the while statement is:

```
while (conditional expression) {
        statement(s);
}
```

- As long as the conditional expression evaluates to TRUE, the statement or command block that follows executes repeatedly
- Each repetition of a looping statement is called an **iteration**
- A while statement keeps repeating until its conditional expression evaluates to FALSE



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- A **counter** is a variable that increments or decrements with each iteration of a loop statement

```
$Count = 1;
while ($Count <= 5) {
        echo " $Count<br /> ";
        ++$Count;
}
echo " <p>You have printed 5 numbers.</p> ";
```

- In an **infinite loop**, a loop statement never ends because its conditional expression is never FALSE

```
$Count = 1;
        while ($Count <= 10) {
                echo " The number is $Count ";
        }
```

do...while Statements

- Test the condition after executing a series of statements then repeats the execution as long as a given conditional expression evaluates to TRUE
- The syntax for the do...while statement is:

do {
statement(s);
} **while** (*conditional expression*);

- do...while statements always execute once, before a conditional expression is evaluated

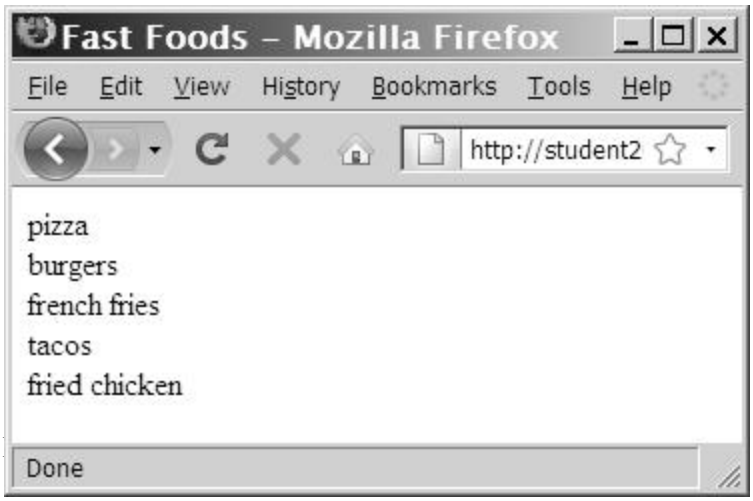
```
$Count = 2;
do {
echo " <p>The count is equal to $Count</p> ";
++$Count;
} while ($Count < 2);
```

for Statements

- Combine the initialize, conditional evaluation, and update portions of a loop into a single statement
- Repeat a statement or a series of statements as long as a given conditional expression evaluates to TRUE
- If the conditional expression evaluates to TRUE, the for statement executes and continues to execute repeatedly until the conditional expression evaluates to FALSE
- Can also include code that initializes a counter and changes its value with each iteration
- The syntax of the for statement is:

for (*counter declaration and initialization*; *condition*;
update statement) {
statement(s);
}

```
$FastFoods = array(" pizza", " burgers ", " french fries ", "
tacos ", " fried chicken ");
for ($Count = 0; $Count < 5; ++$Count) {
        echo $FastFoods[$Count], " <br /> ";
}
```



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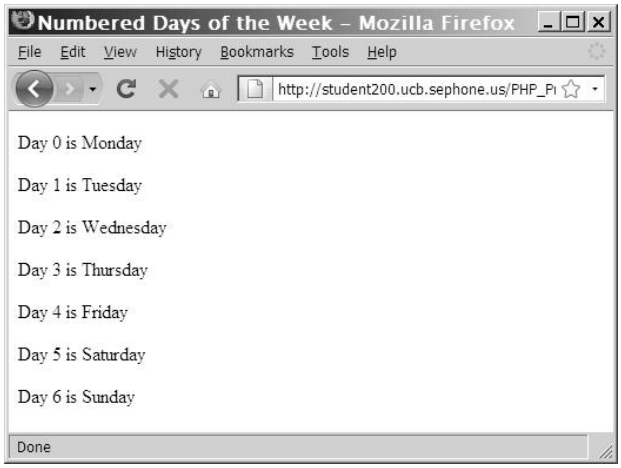
foreach Statements

- Used to iterate or loop through the elements in an array
- Do not require a counter; instead, you specify an array expression within a set of parentheses following the foreach keyword
- The syntax for the foreach statement is:

```
foreach ($array_name as $variable_name) {
        statements;
}
```

```
$DaysOfWeek = array("Monday", "Tuesday", "Wednesday", "Thursday",
"Friday", "Saturday", "Sunday");
foreach ($DaysOfWeek as $Day) {
    echo "<p>$Day</p>";
}
$DaysofWeek = array("Monday", "Tuesday", "Wednesday", "Thursday",
"Friday", "Saturday", "Sunday");
foreach ($DaysOfWeek as $DayNumber => $Day) {
        echo "<p>Day $DayNumber is $Day</p>";
}
```



Including Files

- The include and require statements reuse content by allowing you to insert the content of an external file on multiple Web pages
  - The include statement generates a warning if the include file cannot be found
  - The require statement halts the processing of the Web page and displays an error if the include file cannot be found
- The include_once and require_once statements assure that the external file is added to the script only one time

Summary

- The lines that make up a function are called the **function definition**
- A function parameter that is passed by **value** is a local copy of the variable
- A function parameter that is passed by **reference** is a reference to the original variable
- A **global variable** is declared outside a function and is available to all parts of your program
- A **local variable** is declared inside a function and is only available within the function in which it is declared
- The process of determining the order in which statements execute in a program is called **decision making** or **flow control**
- The if statement is used to execute specific programming code if the evaluation of a conditional expression returns a value of TRUE
- An if statement that includes an else clause is called an if...else statement. An else clause executes when the condition in an if...else statement evaluates to FALSE

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- When one decision-making statement is contained within another decision-making statement, they are referred to as **nested decision-making structures**
- The **switch statement** controls program flow by executing a specific set of statements, depending on the value of an expression
- A **loop statement** is a control structure that repeatedly executes a statement or a series of statements while a specific condition is TRUE or until a specific condition becomes TRUE
- A while statement tests the condition prior to executing the series of statements at each iteration of the loop
- The do...while statement tests the condition after executing a series of statements
- The for statement combines the initialize, conditional evaluation, and update portions of a loop into a single statement
- The foreach statement is used to iterate or loop through the elements in an array
- The include, require, include_once, and require_once statements insert the contents of an external file at the location of the statement

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