Chapter 2

Functions and Control Structures

PHP Programming with MySQL
2nd Edition

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;
}
?>
```

Defining Functions (continued)

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

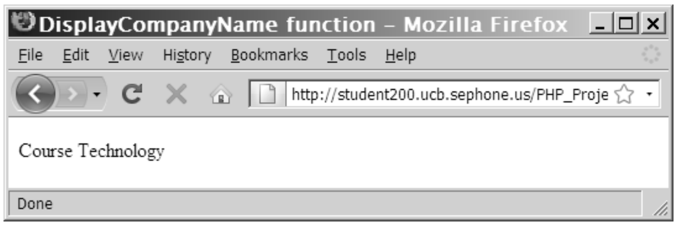
Defining Functions (continued)

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");
```


DisplayCompanyName function – Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://student200.ucb.sephone.us/PHP_Proje
Done

Course Technology

Figure 2-1 Output of a call to a custom function

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

Returning Values (continued)

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

The `global` Keyword (continued)

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

`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;
```

`if` Statements (continued)

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 (})

`if` Statements (continued)

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

`if...else` Statements (continued)

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

switch Statements (continued)

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

switch Statements (continued)

The syntax for the `switch` statement is:

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

`switch` Statements (continued)

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

`switch` Statements (continued)

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

while Statements (continued)

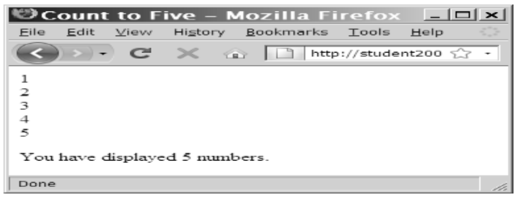
Each repetition of a looping statement is called an **iteration**

A `while` statement keeps repeating until its conditional expression evaluates to `FALSE`

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

while Statements (continued)

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


Count to Five – Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://student200
Done

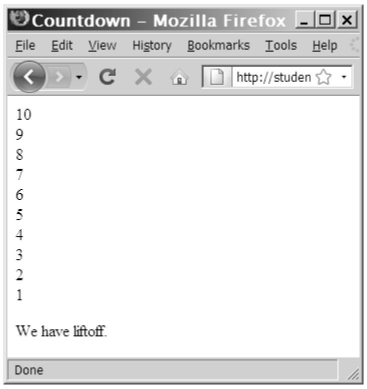
```
1
2
3
4
5

You have displayed 5 numbers.
```

Figure 2-5 Output of a `while` statement using an increment operator

while Statements (continued)

```
$Count = 10;
while ($Count > 0) {
        echo "$Count<br />";
        --$Count;
}
echo "<p>We have liftoff.
     </p>";
```


Countdown – Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://studen
Done

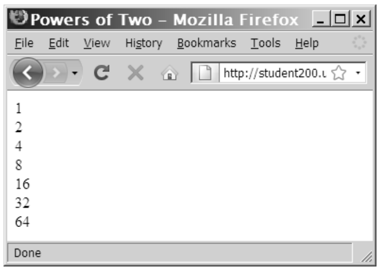
```
10
9
8
7
6
5
4
3
2
1

We have liftoff.
```

Figure 2-6 Output of a `while` statement using a decrement operator

while Statements (continued)

```
$Count = 1;
while ($Count <= 100) {
       echo "$Count<br />";
       $Count *= 2;
}
```


Powers of Two – Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://student200.
Done

```
1
2
4
8
16
32
64
```

Figure 2-7 Output of a `while` statement using the assignment operator *=

`while` Statements (continued)

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);
```

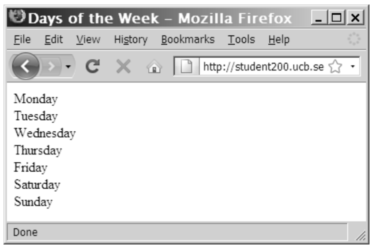
`do...while` Statements (continued)

`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);
```

`do...while` Statements (continued)

```
$DaysOfWeek = array("Monday", "Tuesday", "Wednesday", "Thursday",
"Friday", "Saturday", "Sunday");
$Count = 0;
do {
     echo $DaysOfWeek[$Count], "<br />";
     ++$Count;
} while ($Count < 7);
```


Days of the Week – Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://student200.ucb.se
Done

```
Monday
Tuesday
Wednesday
Thursday
Friday
Saturday
Sunday
```

Figure 2-9 Output of days of week script in Web browser

`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`

`for` Statements (continued)

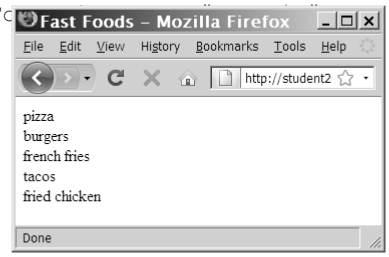
Can also include code that initializes a counter and changes its value with each iteration

The syntax of the `for` statement is:

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

`for` Statements (continued)

```
$FastFoods = array("pizza”,"burgers","french fries", "tacos",
 "fried chicken");
for ($Count = 0; $Count < 5; ++$Count) {
      echo $FastFo
}
```


Fast Foods – Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://student2
Done

```
pizza
burgers
french fries
tacos
fried chicken
```

Figure 2-10 Output of fast foods script

`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:

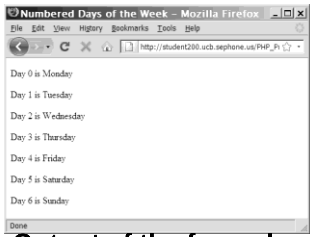
```
foreach ($array_name as $variable_name) {
statements;
}
```

foreach Statements (continued)

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

foreach Statements (continued)

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


Numbered Days of the Week - Mozilla Firefox
File Edit View History Bookmarks Tools Help
http://student200.ucb.sephone.us/PHP_Fi
Done

```
Day 0 is Monday
Day 1 is Tuesday
Day 2 is Wednesday
Day 3 is Thursday
Day 4 is Friday
Day 5 is Saturday
Day 6 is Sunday
```

Figure 2-11 Output of the foreach script with index values

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