

Episode 11

Files

Introduction

When working with data for applications, most of the time that data will be stored in a database. However, there will be times when you'll be working with files to retrieve or store data. In this episode, we are going to learn how to open, close, read and write to files.

Goals

In this section of the course your goals are:

- ☐ To learn how to extract the content of a file.
- ☐ To learn how to open and close a file.
- ☐ To learn how to read data from a file.
- ☐ To learn how to write to a file.
- ☐ To learn about CSV or comma-separated value files.

Getting the content of a file

Before we learn to handle files properly, there are a couple of functions that allow us to read and display the contents of a file, without making any changes to that file.

Let's work with the following text file:

```
The Arrow and the Song
By Henry Wadsworth Longfellow
I shot an arrow into the air,
It fell to earth, I knew not where;
For, so swiftly it flew, the sight
Could not follow it in its flight.
I breathed a song into the air,
It fell to earth, I knew not where;
For who has sight so keen and strong,
That it can follow the flight of song?
Long, long afterward, in an oak
I found the arrow, still unbroke;
And the song, from beginning to end,
I found again in the heart of a friend.
```

The following three functions will read this file in a slightly different way:

```
readfile("poem.txt");
echo "<br><br>";

$text1 = file_get_contents("poem.txt");
echo $text1;
echo "<br><br>";

$text2 = file("poem.txt");
print_r($text2);
```

The **readfile()** function reads the content of the file and displays it on the screen. The **file_get_contents()** function reads the content of the file and returns it as a string. Finally the **file()** function reads the content of the file and returns it as an array. No file manipulation done, just simple data extraction.

Opening and Closing Files

Suppose that you found that poem somewhere online and you want to send a personalized version of it to a good friend.

```
$myFile = fopen("poem.txt", "a+");
// Code for file manipulation goes here.
fclose($myFile);
```

You would start by opening the file with the **fopen()** function. The first argument is the name of the file and the second argument is the mode:

Mode	Explanation
r	Read only

Mode	Explanation
w	Write only, erases content of file
a	Write only, preserves content of file
x	Write only, returns FALSE and error if file exists
r+	Read and Write, then same as r
w+	Read and Write, then same as w
a+	Read and Write, then same as a
x+	Read and Write, then same as x

The `fopen()` function returns a data type known as **resource**, also sometimes called a file handle. This must be stored in a variable to close the file since **`fclose()`** will only accept the file handle as its argument.

Reading and Writing to files

There are a couple of ways to read the content of a file:

```
$text3 = fread($myFile, filesize("poem.txt"));
```

After opening a file the **`fread()`** function returns a string with the content of the file. We can also use the **`fgets()`** function to read one line at a time. Coupled with the **`feof()`** function, which returns a boolean value, we can use a while loop to extract the content of a file.

```
while(!feof($myFile)) {
    echo fgets($myFile). "<br>";
}
```

Now let's make a small change to personalize our poem:

```
$myFile = fopen("poem.txt", "a+");
fwrite($myFile, "\nFor Juli.");
fclose($myFile);
```

After we run this code our text file looks like this:

```
The Arrow and the Song
By Henry Wadsworth Longfellow
I shot an arrow into the air,
It fell to earth, I knew not where;
For, so swiftly it flew, the sight
Could not follow it in its flight.
I breathed a song into the air,
It fell to earth, I knew not where;
For who has sight so keen and strong,
That it can follow the flight of song?
Long, long afterward, in an oak
I found the arrow, still unbroke;
And the song, from beginning to end,
I found again in the heart of a friend.
For Juli.
```

Working with CSV files

A CSV file is a comma-separated value file. These files are usually obtained from spreadsheets and are more common than plain text files for handling data. To manipulate them, you must open and close the files just like we did for text files.

Let's look at an example:

```
$data0 = array("Product", "Category", "Price");
$data1 = array("Television", "Electronics", "499.99");
$data2 = array("Jacket", "Clothing", "54.99");

$dataFile = fopen("data.csv", "a+");
fputcsv($dataFile, $data0);
fputcsv($dataFile, $data1);
fputcsv($dataFile, $data2);
fclose($dataFile);
```

To write to a CSV file, we used the **fputcsv()** function. This function takes as arguments the name of the file to be written to and an array of strings that ends with a new line. CSV are usually opened by the default spreadsheet program on your computer. If you open it that way and add data to the file and save it you can then open the changed file with the following code:

```
$dataFile = fopen("data.csv", "r");
echo "<table>";
while(!feof($dataFile)) {
    $d = fgetcsv($dataFile);
    echo "<tr>";
    foreach($d as $rowItem){
        echo "<td>$rowItem</td>";
    }
    echo "</tr>";
}
echo "</table>";
fclose($dataFile);
```

The while loop check for the end of the file. The **fgetcsv()** function reads a line from the file and returns an array. Then we use the foreach loop to go through each item in the array which we put in a `<td>` tag. In this case code was added to display the contents of the file in a table.

Lab Exercises

For these lab exercises you will need to download the following two files:

[The Road Not Taken](#), (text file).

[Super Bowl Winners](#), (csv file).

- Using the appropriate function examine the contents of the text file without changing anything.
 - The poem has four stanzas of five lines each. Write a script to display the poem with a space after the author's name and a space in between stanzas.
- Write a script to display the contents of the csv file in a table.
- Add one last line to the csv file to include the 2019 winners.