COMP284 Practical 4
PHP (1)

Introduction

- This worksheet contains exercises that are intended to familiarise you with PHP Programming. While you work through the exercises below compare your results with those of your fellow students and ask for help and comments if required.

- This document can be found at

  http://cgi.csc.liv.ac.uk/~ullrich/COMP284/notes/practical04.pdf

  and you might proceed more quickly if you cut-and-paste code from that PDF file. Note that a cut-and-paste operation may introduce extra spaces into your code. It is important that those are removed and that your code exactly matches that shown in this worksheet.

- The exercises and instructions in this worksheet assume that you use the Department's Linux systems to experiment with PHP.

  If you want to use the Department's Windows systems instead, then you can do so.

- To keep things simple, we will just use a text editor, a terminal, and a web browser. You can use whatever text e   e with.

- If you do not manage to get th
  complete in you

Exercises

1. Let us start by re-creating the 'Hello World' PHP script that you have seen in the lectures.

   It is assumed that you have already created a directory

   $HOME/public_html/

   in the last practical session and that the directory is both readable and executable by everyone. Make sure that this is so before you proceed.

   a. Open a text editor and enter the following PHP code:

   ```
   <!DOCTYPE html>
   <html>
     <head>
       <title>PHP Scalars</title>
     </head>
     <body>
       <h1>PHP Scalars</h1>
   <?php
     $user = "<your name>";
     print ("<p><b>Hello $user<br>\nHello World!</b></p>\n");
   ?>
     </body>
   </html>
   ```

Replace `<your name>` with your own name.

b. Save the code to a file named `php04A.php` in `$HOME/public_html/`.

c. In a terminal, go to the directory in which the file has been stored, make sure the file `php04A` cannot be read, written or executed by anyone else using the command

```
chmod o-rwx php04A
```

and execute the PHP script by using the command

```
php ./php04A.php
```

in the terminal. Check that there are no syntax errors and the output is

```
<!DOCTYPE html>
<html>
  <head>
    <title>PHP Scalars</title>
  </head>
  <body>
    <h1>PHP Scalarst</h1>
<p><b>Hello <your name><br>
Hello World!</b></p>
  </body>
</html>
```

(Obviously, with your name appearing instead of `<your name>`.)

d. Now open a web browser and access the URL

`4A.php`

where `<user>`

Make sure that the web page you are shown correspon

seen in Exercise 1c above.

Hint: Your web browser can shown you the HTML sour

e. It is good practice to add information about who created a script/web page, who claims copyright and when a script/web page was created.

Add these three pieces of information to the script using `META` declarations. See

```
https://www.w3.org/TR/html52/single-page.html#the-meta-element
```

for details.

2. The following example deals with the use of *constants* in PHP code.

a. Add the following PHP code to the end of the current PHP code in `php04A.php` (make sure that the additional PHP code is included before `?>`):

```
define("PI",3.14159);
define("SPEED_OF_LIGHT",299792458,true);
print "1 - Value of PI: PI<br>\n";
print "2 - Value of PI: ".PI."<br>\n";
$diameter = 2;
$time     = 3;
$circumference1 = PI * $diameter;
$circumference2 = pi * $diameter;
$distance   = speed_of_light * $time;
echo "Diameter = $diameter => ",
```

2

```
       "Circumference1 = $circumference1 | ",
       "Circumference2 = $circumference2<br>\n";
echo "Time     = $time => Distance = $distance<br>\n";
```

b. Save the file and execute the script again using the web browser.

c. Check that the additional output shown in the web browser starts with the two lines

```
1 - Value of PI: PI
2 - Value of PI: 3.14159
```

and that you understand how the difference between lines 1 and 2 comes about.

d. Make sure that you understand how the constants `PI` and `SPEED_OF_LIGHT` 'work' and why the output indicates that `Circumference1` has value 6.28318 while `Circumference2` has value 0.

e. Change your script so that the four lines of output produced by the code in Exercise 2a appear in a red bold-face font in the web browser.

3. The following example deals with *types, type casting,* and the identification of types in PHP.

   a. Add the following PHP code to the end of the current PHP code in `php04A.php`:

```
$mode = rand(0,4);
if ($mode == 1)
   $randvar = ra
elseif ($mode
   $randvar = (s
elseif ($mode == 3)
   $randvar = rand()/(rand()+1);
else
   $randvar = (bool) $mode;
echo "Random scalar: $randvar<br>\n";
```

   b. Save the file and execute the script several times using the web browser. See how the value of `$randvar` changes every time that the script is executed.

   c. Extend the script with code that displays

   - `This is a natural number`   if `$randvar` stores a natural number
   - `This is a floating-point number`   if `$randvar` stores a floating-point number
   - `This is a string`   if `$randvar` stores a string
   - `I don't know what this is`   in any other case

   after the line `Random scalar: ....`. You are not allowed to use the value of `$mode` for this purpose.

   Hints: Recall from the lecture notes what `gettype()`, `is_int()`, `is_string()`, etc do. Also have a look at switch statements in PHP:

   http://php.net/manual/en/control-structures.switch.php

4. The following example deals with *comparison operators* and the generation of HTML tables in PHP.

   a. Add the following PHP code to the end of the current PHP code in `php04A.php`:

```
$a = array(0,123,1.23e2,"123",TRUE,FALSE);
echo "<table border='1' cellpadding='5'>\n";
foreach ($a as $sa)
  foreach ($a as $sb) {
    $val_sa = gettype($sa)."(".var_export($sa,true).")";
    $val_sb = gettype($sb)."(".var_export($sb,true).")";
    echo "<tr>";
    printf("<td>%20s == %20s -> %5s</td>", $val_sa,$val_sb,
          ($sa == $sb) ? "TRUE" : "FALSE");
    printf("<td>%20s === %20s -> %5s</td>",$val_sa,$val_sb,
          ($sa === $sb) ? "TRUE" : "FALSE");
    printf("<td>%20s != %20s -> %5s</td>", $val_sa,$val_sb,
          ($sa != $sb) ? "TRUE" : "FALSE");
    printf("<td>%20s !== %20s -> %5s</td>",$val_sa,$val_sb,
          ($sa !== $sb) ? "TRUE" : "FALSE");
    echo "</tr>";
}
echo "</table>\n";
```

b. Save the file and execute the script again using the web browser. Analyse the table that the additional code produces and make sure that you understand its content. Also make sure that you understand how the code above produces that table (Generating tables is a typical task for which PHP code is used.)

5. The following example .... , *string operations* and *pattern search and rep[...]*

   a. Open a text editor and enter the following PHP code:

```
<!DOCTYPE html>
<html>
  <head>
    <title>PHP Arrays</title>
  </head>
  <body>
    <h1>PHP Arrays</h1>
<?php
$names = array("Sebastian Coope", "Andrew Craig",
                "Prof Karl Tuyls", "Dr Ullrich Hustadt",
                "Dr Michele Zito");
// Your own code here
foreach ($names as $name)
  print("Name: $name<br>\n");
?>
  </body>
</html>
```

   b. Save the code to a file named php04B.php in $HOME/public_html/, adjust its access rights as shown in Exercise 1c, then execute the script using the web browser.

   The output produced by the code above should be as follows:

```
Name: Sebastian Coope
Name: Andrew Craig
```

```
Name: Prof Karl Tuyls
Name: Dr Ullrich Hustadt
Name: Dr Michele Zito
```

c. Add code at the point indicated in the code in Exercise 5a that modifies the strings stored in $names so that the output produced will change to:

```
Name: COOPE, Sebastian
Name: CRAIG, Andrew
Name: TUYLS, Karl
Name: HUSTADT, Ullrich
NAME: ZITO, Michele
```

This should be done with the help of string manipulation operations, see, for example,

http://www.php.net/manual/en/function.preg-match.php
http://www.php.net/manual/en/function.preg-replace-callback.php

and the code should be independent of the actual names stored in $names.

Hints: Recall from the lecture notes (Lecture 6, Slide 5) how this was done in Perl. Also recall from the lecture notes the variation of a foreach-loop that allows you to modify the elements of an array.

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