PHP: FIRST STEPS

PHP (<u>P</u>HP: <u>H</u>ypertext <u>P</u>reprocessor ; yes, this is a recursive acronym[1]) is a language whose goal is to output another language: HTML.

Preprocessor means that first, the server processes the PHP code, before outputting an HTML file. There is the same mechanism in `C` / `C++`: you can write pre-processor directives that will be processed <u>before</u> the code is actually executed. Listing 1 gives an example of such a code.

```
1  #ifdef _OPENMP
2  #pragma omp parallel
3      {
4  #pragma omp master
5          {
6              k = omp_get_num_threads();
7              printf ("Number of Threads requested = %i\n",k);
8          }
9      }
10 #endif
```

Listing 1: C pre-processor directives — http://www.cs.virginia.edu/stream/ref.html.

Pre-processing is a way to "program the program". When executed, only the processed program is relevant. Listing 1 is an example where the same program can be used on a machine on which we have access to a multiple-core library (a core is a computing unit), but also on a machine on which we do not have such an access. Without pre-processing directives, this code would cause an error on such machines (the function `omp_get_num_threads()` would not exist). With pre-processing directives, this code is not seen by such a machine, and no error is raised.

In the case of PHP, it is somewhat different. When a user requests a PHP page, the following happens: PHP is executed on the server, a HTML page is given as output, and this page is given back to the user. In a way, PHP is here to "hide" some complex interactions to the user, who is just able to see the final HTML webpage, and not how it was generated. Listing 2 is our first PHP webpage. The server processes it, and then sends the webpage in Listing 3. We will see how to use a PHP server later; to begin with, you can test simple PHP code on:

https://phpsandbox.io/

https://www.w3schools.com/php/phptryit.asp?filename=tryphp_compiler

https://sandbox.onlinephpfunctions.com/

```
1  <!DOCTYPE HTML>
2  <HTML>
3  <HEAD>
4  <TITLE>Welcome in S7</TITLE>
5  </HEAD>
6  <BODY>
7  <?php
8      echo "<p>Welcome in S7!</p>";
9  ?>
10 </BODY>
11 </HTML>
```

Listing 2: Our first PHP page.

```
1  <!DOCTYPE HTML>
2  <HTML>
3  <HEAD>
4  <TITLE>Welcome in S7</TITLE>
5  </HEAD>
6  <BODY>
7  <p>Welcome in S7!</p>
8  </BODY>
9  </HTML>
```

Listing 3: Output of our first PHP page.

In this file, you can see that everything between `<?php` and `?>` is PHP code. You can put multiple such tags inside a PHP file. Then we used the most simple function in PHP: echo, which is the equivalent of print in Python: it just prints a value. As you can see, the string `<p>Welcome in S7!</p>` is hence added to the file.

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[1]The famous VISA brand created a subsidiary company whose name is "Visa International Service Association", I guess the name was chosen on purpose so that the initial also form a recursive acronym.

I give below some python programs we wrote last year and their translation to PHP syntax.

```python
1  total_damage = 1200
2  deductible = 0.1 * total_damage
3  if (deductible < 15):
4      deductible = 15
5  elif (deductible > 500):
6      deductible = 500
7  reimbursement = total_damage - deductible
8  print("The insurance will reimburse " + str(reimbursement) + " ; the
       deductible is " + str(deductible) + ".")
```

Listing 4: Insurance deductible (Work 7)

```php
1  $total_damage = 1200;
2  $deductible = 0.1 * $total_damage;
3  if ($deductible < 15) {
4      $deductible = 15;
5  } else if ($deductible > 500) {
6      $deductible = 500;
7  }
8  $reimbursement = $total_damage - $deductible;
9  echo "The insurance will reimburse " . $reimbursement . " ; the deductible is
       " . $deductible . ".";
```

Listing 5: Insurance deductible (Work 7)

```python
1  def expo(x, n):
2      a = 1
3      for i in range(n):
4          a = a * x
5      return a
6  print(expo(2, 3))
```

Listing 6: Exponentiation (Work 7)

```php
1  function expo($x, $n) {
2      $a = 1;
3      for($i = 0; $i < $n; $i++) {
4          $a = $a * $x;
5      }
6      return $a;
7  }
8  echo expo(2, 3);
```

Listing 7: Exponentiation (Work 7)

```python
1  array = [32, 5, 12, 8, 3, 75, 2, 15]
2  sum = 0
3  for e in array:
4      sum = sum + e
5  print("The sum of all elements in
      this array is", sum)
```

Listing 8: Sum of an array

```php
1  $array = [32, 5, 12, 8, 3, 75, 2,
      15];
2  $sum = 0;
3  foreach($array as $e) {
4      $sum = $sum + $e;
5  }
6  echo "The sum of all elements in
      this array is " . $sum;
```

Listing 9: Sum of an array

Your goal is still, like last week, to make a webpage that has the same rendering as my website on Figure 1. The "☑" image (with inverted colors, because it's on a black background) is available at http://www.barsamian.am/2022-2023/S7ICTE/TP3_select_all_white.png.

Here are some hints:

- To create checkboxes, see Listing 10.

- It would be way easier to use arrays that contain all the values to be displayed. They are given in Listing 11.

European School B Tests Database

Search exercises inside the database

See the list of all exams in the database

Levels (European Schools)	
☐ S4P4	☐ S5P4
☐ S4P6	☐ S5P6
S6P3 ☐ (Old) ☐ (New Syllabus)	
S6P5 ☐ (New Syllabus)	
S7P3 ☐ (Old) ☐ (New Syllabus - Sample Exams)	
S7P5 ☑ (New Syllabus - Sample Exams)	

Levels (French System)
☐ Term. ES (Economy Social)

Technological tool	
☐ With	☐ Without

Languages	
☐ Spanish	☐ Czech
☐ French	☐ Polish
☐ English	☐ Danish
☐ German	☐ Hungarian
☐ Italian	☐ Dutch

☑ Algebra
☐ Square roots
☐ Powers, Sci. notation
☐ Proportionality, Linearity
☐ Equations
☐ Rational numbers
☐ Special ids., Pascal triangle
☐ System of equations
☐ Polynomials
☐ Quadratic equations
☐ Trigonometric equations
☐ Exponentials
☐ Logarithms
☐ Prime numbers
☐ Sequences: arith. / geo.
☐ Sequences: other
☐ Complex numbers
☐ Multiple choice (MCQ)

☑ Analysis
☐ Linear functions
☐ Graph of a function
☐ Images and inverse images
☐ Variations, Extremums
☐ Quadratic functions
☐ Polynomial functions
☐ Periodic functions
☐ Exponential functions
☐ Logarithmic functions
☐ Limits, Asymptotes
☐ Derivatives, Tangent lines
☐ Primitives, Integral calculus
☐ Area under the curve
☐ Functions of 2 vars.
☐ Composite functions
☐ Multiple choice (MCQ)

☑ Geometry
☐ Pythagoras theorem
☐ Trigonometric ratios
☐ Circles
☐ Enlargement / reduction
☐ Intercept theorem (Thales)
☐ Vectors: coordinate system
☐ Radians
☐ Trigonometric formulae
☐ Vectors: scalar product
☐ 3d geometry
☐ Area computation
☐ Volume computation
☐ Parametric equations
☐ Multiple choice (MCQ)

Figure 1: Screenshot of http://www.barsamian.am/mathsexams

```html
<!-- This code creates a checkbox. The id connects the box and the text next
    to it (the "label" tag), so that you can also click on the text to check
    the box. The name and the value are passed when the form is submitted. If
     the box was checked, the name is associated to this value, else it is
    associated with "False". It is possible to put multiple checkboxes with
    the same name, then when the form is submitted, all the values that were
    checked for a given name are put together in an array. -->
<input type="checkbox" id="my_id" name="my_name" value="my_value">
<label for="my_id">Some displayed text</label>
```

Listing 10: How to create a checkbox.

```php
$levels = ["S4P4", "S4P6", "S5P4", "S5P6", "S6P3", "S6P5", "S7P3", "S7P5"];
$tool = ["With", "Without"];
$languages = ["Danish", "English", "French", "German", "Polish", "Slovenian"
    ];
$algebra_topics = ["Square roots", "Powers", "Proportionality", "Equations",
    "Equation of a line", "Linearity", "Special identities", "System of
    equations", "Polynomials", "Quadratic equations", "Trigonometric
    equations", "Exponentials", "Logarithms", "Prime numbers", "Rational
    numbers"];
$analysis_topics = ["Linear functions", "Graph of a function", "Images and
    inverse images", "Roots of a function", "Quadratic functions", "
    Trigonometric functions", "Exponential functions", "Logarithmic functions
    ", "Limits", "Derivatives", "Integral calculus", "Area under the curve",
    "Primitives", "Polynomial functions", "Tangent lines"];
$geometry_topics = ["Pythagoras", "Trigonometric ratios", "Circles", "
    Enlargement / reduction", "Thales", "Vectors : coordinate system", "
    Radians", "Trigonometric formulae", "Vectors : scalar product", "3d
    geometry", "Area computation", "Volume computation"];
```

Listing 11: Arrays needed to construct the HTML page. Download directly the file that contains them at http://www.barsamian.am/2022-2023/S7ICTE/TP4_Form.txt (and rename it to .php or copy / paste the code in a php file).